

MATERIALS TOWARD A MONOGRAPH OF THE GENUS VITEX. XI

Harold N. Moldenke

VITEX TRIFOLIA var. SIMPLICIFOLIA Cham.

Citations: HAWAIIAN ISLANDS: Kauai: A. A. Heller 2731 (Mi—photo); Saint John, Hosaka, Hume, Inafuku, Lindsay, Mitchell, & Wong 10841 (Gg); C. Skottsberg 1059 (Go). Lanai: Munro 90 (Bz—25360). Maui: Mann & Brigham 409 (It, Ms, N, Pa); Topping s.n. [Degener 9504] (I, Ms, N). Molokai: Degener 9506 (Gg—267592, Ms, N), 9507 (N). Oahu: Degener 10018 (I, N), H.20 (Ms, N), H.226 (N), s.n. [April 8, 1923] (Gg—267594); Fosberg 10360 (Du—239418, En), 27125 (Ew); H. Hapeman s.n. [Waialua, May 1, 1908] (Hp, Mi, Ur); J. A. Harris C.242140 (Go, N), C.242201 (Go, N); Herb. Oahu College 64 (Mi); Lyons s.n. [Waikiki, March 1889] (H—106471); Selling 3714 (Go, S); C. Skottsberg 235 (Go, S). Island undesignated: J. F. C. Rock 48 (N), 50 (Ba); Wilkes s.n. [U. S. Expl. Exped., Sandwich Isls.] (T). NEW HEBRIDES: Aneityum: Kajewski 690 (La, N). AUSTRALIA: Queensland: E. Bêche s.n. [8.1901; Herb. Prager 20488/2265] (Gg—31485, Na—18564); Collector undesignated 10 (S); Michael 1018 (Bz—25237); F. Mueller s.n. [Rockingham Bay] (Bz—25358); C. T. White 8957 (N, N). THURSDAY ISLAND: Henne s.n. (Bz—25359). SOCIETY ISLANDS: Tahiti: Sparrman s.n. (S). CULTIVATED: China: Hom A.387 [Herb. Lingnan Univ. 18794] (N). Germany: Döllinger s.n. [Herb. Acad. Herbip.] (Mu—685); Herb. Hort. Bot. Berol. s.n. [1827] (B). Hongkong: Herb. Hongkong Bot. Gard. s.n. (S). Java: Herb. Hort. Bot. Bogor. XV.F.50 (Bz—26351), XV.JA.XXXV.1 (Ba), XV.JA.XXV.1a (Bz—26416); Kuntze 4445, in part (N). Netherlands: Herb. Hort. Bot. s.n. (Ut—49902). Queensland: Flecker 13908 (Le). LOCALITY OF COLLECTION UNDETERMINED: Dahl s. n. (S); Henry s.n. [Deep Water Bay, 21-6-97] (N); Herb. Linnaeus G.811, S.1 (Ls, N—photo, Z—photo); Herb. Swartz s.n. (S); Herb. Tjibodas s.n. (Bz—26506); Thunberg 14 (S); Wallis s.n. [Herb. Reichenbach f. 129054] (V). MOUNTED ILLUSTRATIONS: Ferd. Bauer Icon. Nov. Holl. 967 (V), 967a (V), s.n. (V).

VITEX TRIFOLIA var. SIMPLICIFOLIA f. ALBIFLORA (Y. Matsumura)

Moldenke, Phytologia 2: 477. 1948.

Synonymy: Vitex rotundifolia var. albiflora Y. Matsumura, Amatores Herbarii 10: 54. 1943.

Literature: Y. Matsumura, Amatores Herbarii 10: 54. 1943; Moldenke, Phytologia 2: 477. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 134 & 203. 1949.

This form differs from the typical form of the variety in having its corollas white.

Citations: JAPAN: Honshiu: Y. Matsumura 6001 (N).

VITEX TRIFOLIA var. VARIEGATA Moldenke, *Phytologia* 2: 31. 1941.

Literature: Moldenke, *Phytologia* 2: 31. 1941; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 75 & 104 (1942) and [ed. 2], 166 & 203. 1949.

This variety differs from the typical form of the species in having the leaflets variegated with whitish spots in irregular mottles along and near the edges.

The type of the variety was collected by Walter M. Buswell from cultivated material at or near Miami, Dade County, Florida, in 1940, and is deposited in the L. H. Bailey Herbarium at Cornell University. I have personally seen the variety grown as a hedge at Key West, Monroe County, and on Sanibel Island, Lee County, Florida.

Citations: CULTIVATED: Florida: Buswell s.n. [So. Florida, 1940] (Ba—type, N—photo of type, Z—photo of type), s.n. [Miami, Aug. 21, 1941] (N); P. O. Schallert 23077 (Je—8832). New York: C. Pecora s.n. [Aug. 8, 1949] (N), s.n. [Oct. 21, 1949] (N). Bahamas: Howard & Howard 10295 (N).

VITEX TRIPINNATA (Lour.) Merr., *Trans. Am. Phil. Soc.*, new ser., 24 (2): 335. 1935.

Synonymy: Tripinna tripinnata Lour., *Fl. Cochinch.* 391. 1790. Tanaecium tripinna Raeusch., *Nomencl. Bot.*, ed. 3, 178, nom. nud. 1797. Tripinnaria cochinchinensis Pers., *Syn. Pl.* 2: 173. 1806. Tripinnaria asiatica Spreng., *Syst. Veg.* 2: 842. 1825. Tripinnaria tripinnata Steud., *Nom. Bot.*, ed. 2, 2: 712. 1841. Colea tripinnata Seem., *Bonplandia* 4: 128. 1856. Vitex leptobotrys H. Hallier, *Meded. Rijks Herb. Leid.* 37: 48—49. 1918. Vitex annamensis Dop, *Bull. Soc. Hist. Nat. Toulouse* 57: 204—204. 1928. Vitex leptobotrys H. Hallier ex Moldenke, *Alph. List Invalid Names* 53, in syn. 1942.

Literature: Lour., *Fl. Cochinch.*, ed. 1, 391 (1790) and ed. Willd., 476. 1793; Raeusch., *Nomencl. Bot.*, ed. 3, 178. 1797; Pers., *Syn. Pl.* 2: 173. 1806; Spreng., *Syst. Veg.* 2: 842. 1825; Steud., *Nom. Bot.*, ed. 2, 2: 712. 1841; Seem., *Bonplandia* 4: 128. 1856; Baill., *Bull. Soc. Linn. Paris* 1: 714. 1888; Jacks., *Ind. Kew.* 1: 582 (1893) and 2: 1121. 1895; H. Hallier, *Meded. Rijks Herb. Leid.* 37: 48—49. 1918; Moore, *Journ. Bot.* 63: 286. 1925; Dop, *Bull. Soc. Hist. Nat. Toulouse* 57: 203—204. 1928; E. D. Merr., *Trans. Am. Phil. Soc.*, new ser., 24 (2): 335. 1935; Dop in Lecomte, *Fl. Gén. Indo-chine* 4: 811 & 848. 1935; Hill, *Ind. Kew. Suppl.* 9: 298. 1938; Worsdell, *Ind. Lond. Suppl.* 2: 500. 1941; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 1], 59 & 104. 1942; Moldenke, *Alph. List Invalid Names* 52 & 53. 1942; Moldenke, *Known Geogr. Distrib. Verbenac.*, [ed. 2], 137 & 203. 1949.

Illustrations: Dop in Lecomte, *Fl. Gén. Indo-chine* 4: 811 & 848. 1935.

Tree, 7—8 m. tall; branchlets rounded, glabrous; bark gray, striate; leaves 3-foliolate; petioles slender, canaliculate, glabrous; leaflet-blades subcoriaceous or chartaceous, broadly obo-

vate or almost rhomboid, varying to rounded, 5--6.5 cm. long, 3--5 cm. wide, obtuse or abruptly short-acuminate at the apex, entire, attenuate (on the central ones) or rounded and inequilateral (on the lateral ones) at the base, glabrous on both surfaces but scabrous and glandulose above, shiny, the young ones yellow in drying; secondaries slender, 10--14, slightly recurved at the margins; veinlet reticulation inconspicuous; petiolules 2--4 mm. long on lateral leaflets and 6--12 mm. long on central ones; inflorescence paniculate, terminal, glabrous, lax, few-flowered, subsessile, the branches opposite and brachiate, the cymules dichotomous and 2-flowered; peduncles 5--6 mm. long; pedicels slender, 5--10 mm. long; bracts and bractlets very small, firm, acute at the apex; flowers about 10 mm. long, odorous; calyx campanulate, about 3 mm. long, glabrous but glandulose on the outside, the rim 5-lobed, the lobes triangular, about 1 mm. long, obtuse at the apex; corolla yellowish or yellowish-white, its tube glabrous on the outside, somewhat hairy at the insertion of the stamens within, about 5 mm. long, the limb pubescent on the outside, the upper lip 2-lobed, the lobes linear, 2--3 mm. long, glabrous within, the lower lip with its middle lobe about 4 mm. long and slightly pilose at the base within; stamens scarcely exerted; style thickened at the base, equaling the stamens; stigma bifid; ovary glabrous; fruit drupaceous, black, rounded, 5--6 mm. in diameter.

The species is based on a Loureiro collection from "sylvia montanis Cochinchinae" Baillon, in the reference cited above, states that the Loureiro specimen preserved in the herbarium of the British Museum is a species of Vitex and very near, if not identical with numerous specimens collected by Pierre in Indochina. Moore later confirmed this and asserts that Loureiro's type may be conspecific with Pierre 1864. Loureiro apparently erred in describing the fruits of his plant as many-seeded and the leaves as tripinnate. He probably meant to say trifoliate, because the leaves of his type specimen are trifoliate. These 2 erroneous characters led Seemann to place Tripinna Lour. in the Bignoniaceae. The rather long list of synonyms, based on what was to the authors proposing them, an unknown species or, at least, one known only from Loureiro's incomplete and inaccurate description, illustrates the mistakes that can be made when the original type specimens are not examined.

Vitex annamensis was based on Poilane 2765 from near Nhatrang in the Massif du Co Hin and on Poilane 5582, 8555, and 12560 from Ca Na in the province of Phanrang, Indochina. The type of V. leptobotrys is Balansa 3815, collected in woods at Tu-Phap, Tonkin, in May, 1887. The binomials proposed by Persoon, Sprengel, Steudel, and Seemann, cited above, were all based on Loureiro's binomial.

The species is said to be a common tree in open places along rivers, and a shrub along trails, blooming from May to July. The flowers are said to be yellow or red. Herbarium material has been misidentified as Cornutia quinata Lour. and Vitex quinata (Lour.)

F. N. Will. Common names are "cây den" and "sa khang".

Citations: HAINAN ISLAND: How 72997 (Bz—23804). INDOCHINA: Annam: Clemens & Clemens 3394 (N, Ut—104a); Poillane 17 (N), 17901 (N). Cambodia: Béjand 223 (N). Tonkin: Pételot 5869 (Bz—23803, Er), 6080 (N), 6398 (Bz—24247, N), 6419 (Bz—24248, N), 6853 (N). Laos: Vidal 2201 (Z). THAILAND: Pierre 79 (Bz—72847).

VITEX TRISTIS S. Elliot, Journ. Linn. Soc. Lond. Bot. 29: 42. 1891.

Literature: S. Elliot, Journ. Linn. Soc. Lond. Bot. 29: 42. 1891; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 76, 78, & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104 (1942) and [ed. 2], 123 & 203. 1949.

Large tree; branchlets and twigs slender, gray-brownish, very obtusely tetragonal or subterete, the younger parts glaucescent and very smooth and shiny, the very youngest parts appressed-pilose with short antrorse hairs, soon glabrescent; nodes not annulate; principal internodes 1—4 cm. long, mostly abbreviated; leaf-scars rather large, sunken, not conspicuously prominent; leaves decussate-opposite, 1-foliolate; petioles slender, 6—21 mm. long, sparsely pilosulous when young, soon glabrescent, often glaucescent, especially at the base, flattened and canaliculate above; blades subcoriaceous, uniformly dull-green on both surfaces, oblong or elliptic, 3—10.5 cm. long, 1.2—4.5 cm. wide, regularly emarginate at the rounded apex, entire and somewhat revolute along the margins, acute at the base, glabrous on both surfaces; midrib slender, impressed above, prominent beneath; secondaries filiform, 5—9 per side, irregular, ascending, very irregularly anastomosing in many loops some distance from the margins, obscure or very slightly subimpressed above, sometimes almost indiscernible; veinlet reticulation rather sparse, mostly obscure or indiscernible above or very rarely slightly subimpressed, slightly subprominulous beneath; inflorescence axillary, mostly at or near the tips of the twigs, the cymes mostly 3-flowered, shorter than the subtending leaves; peduncles very slender or filiform, 6—12 mm. long, flattened, brunneous in drying, glabrous; pedicels filiform, 1.5—9 mm. long, glabrous, brunneous in drying; bracts large, foliaceous, ovate, membranous, 7—10 mm. long, 5—6 mm. wide, usually about twice as long as wide, acute at the apex and base, glabrous on both surfaces; calyx tubular-campanulate, developing much more rapidly than the corolla (*i.e.*, with the young corolla-bud lying at the base of the much larger calyx), to 2 cm. long when mature, membranous, glabrous, to 12 mm. wide at the apex when mature, venose, its rim 5-dentate, the teeth ovate, regular, 2—3 mm. long, rounded or obtuse at the apex; corolla pale-red, infundibular-cylindric, slightly incurved, its tube about 15 mm. long, glabrous or very slightly pilosulous, the lobes about 5 mm. long, lingulate, rounded at the apex, pilosulous; stamens and style slightly exserted; ovary merely glandulose.

The type of this species was collected by George Francis



Scott Elliot (no. 2612) in woods at Fort Dauphin, Madagascar, blooming in May, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. A vernacular name is "yndringuenitra".

Citations: MADAGASCAR: Cloisel 92 (P), 113 (N, P); Scott Elliot 2612 (K--type, N--photo of type, P--isotype, Z--photo of type).

VITEX UBANGHENSIS A. Chev., Etud. Fl. Afr. Cent. Franç. 1: 244, hyponym. 1913.

Literature: A. Chev., Etud. Fl. Afr. Cent. Franç. 1: 244. 1913; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 79. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104 (1942) and [ed. 2], 114 & 203. 1949.

Nothing is known of this species except that its type is Chevalier 6943, collected at Ndelle, upper Chari, December 20--25, 1902, and on Chevalier 10561, from the basin of the Tomi, beyond Mpokou, in upper Ubangi, December 6--10, 1903. No description of the plant has as yet been published.

VITEX UMBROSA Sw., Fl. Ind. Occid. 2: 1076--1077. 1800 [not V. umbrosa G. Don, 1824, nor Schau., 1940, nor "Sw. sensu Pulle", 1940].

Synonymy: Nephandra Cothen. apud Willd., Sp. Pl. 3: 393, in syn. 1801.

Literature: Willd. in Cothen., Dispos. Veg. 8. 1790; Sw., Fl. Ind. Occid. 2: 1076--1077. 1800; Willd., Sp. Pl. 3: 392--393. 1801; G. F. W. Mey., Prim. Fl. Esseq. 218--219. 1818; Benth., Ann. Nat. Hist. 2: 449. 1839; Ettingsh., Blatt-Skel. Dikot. 79, pl. 32, fig. 8. 1861; Fawcett, Econom. Pl. 76. 1891; Fawcett, Provis. List Indig. Nat. Flow. Pl. Jamaica 30. 1893; Seymour, Host Ind. Fungi N. Am. 588--589. 1929; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Alph. List Common Names 6, 12, 33, & 34. 1939; Moldenke, Geogr. Distrib. Avicenn. 6. 1939; Moldenke, Prelim. Alph. List Invalid Names 33 & 52. 1940; Moldenke in Pulle, Fl. Suriname 4 (2): 307. 1940; Moldenke, Alph. List Invalid Names 33 & 55. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 26 & 104. 1942; Moldenke, Phytologia 2: 122--123. 1944; H. N. & A. L. Moldenke, Anal. Inst. Biol. Mex. 20: 15. 1949; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 47 & 203. 1949; Roig, Dicc. Bot. 1: 828--829. 1953.

Illustrations: Ettingsh., Blatt-Skel. Dikot. pl. 32, fig. 8. 1861.

Large spreading tree, to 15 m. tall; trunk to 1 m. in diameter; branchlets rather stoutish, gray, obtusely tetragonal, very medullose, minutely puberulent, becoming glabrate; twigs medium or stoutish, obtusely tetragonal, brownish, densely puberulent when young; nodes annulate; principal internodes 0.3--5 cm. long, mostly greatly abbreviated; leaves decussate-opposite, 5--7-foliolate; petioles slender or stout, 3.5--7.5 cm. long, convex beneath, conspicuously flattened and submargined above, densely puberulent with very minute cinereous hairs, very

slightly or not at all ampliate at the base, not disciform at the apex nor annulate; leaflets subequal or the lower ones much smaller, all rather long-petiolulate, the petiolules slender or stout, 2--22 mm. long, densely puberulent, deeply canaliculate and margined above, the lowermost ones usually considerably shorter than the central ones; leaflet-blades chartaceous, becoming firm in age, dark-green above, lighter beneath, the central one elliptic or ovate, often rather broad, 1.8--20 cm. long, 2.2--8.3 cm. wide, varying from obtuse and rounded to acute or very slightly short-acuminate at the apex (rarely emarginate), entire, rounded or acute at the base, sometimes slightly inequilateral, very lightly and obscurely pulverulent-puberulent on both surfaces (especially along the midrib), becoming glabrous and nitid, the lateral ones similar in all respects only usually smaller, shorter-stipitate, and more obtuse at the apex; midrib slender, flat or obscurely subimpressed above, prominent beneath; secondaries slender, 8--15 per side, arcuate-ascending, slightly prominulent above, prominulent beneath, arcuately joined near the margins; vein and veinlet reticulation fine and rather abundant, subprominulent above, obscure or the larger parts subprominulent beneath; inflorescence axillary, paniculate, 15--25 cm. long, 2--7 cm. wide, composed of 2--7 pairs of secondary panicles or long-stipitate and loosely branched cymes, many-flowered, very lax and loose-flowered, lightly or densely short-puberulent throughout with very minute canescent or gray-brown hairs; peduncle (4--9 cm. long) and rachis very slender, usually flattened, puberulent; bracts large and foliaceous, often a pair subtending the lowest branches, 5-foliolate, resembling the leaves in all respects but much smaller; bractlets varying from oblong to linear, simple, stipitate, 3--10 mm. long; prophylla linear, about 1 mm. long, densely puberulent; pedicels slender, 1--4 mm. long, puberulent; corolla blue, 2-lipped; fruit yellow, with the odor of apples (*Malus*).

The species inhabits woods, pastures, stream banks, and steep slopes near rivers, blooming in May. It has been collected in fruit in June, July, and September, and has been found at altitudes of 265 to 700 meters. A good fruit specimen is Britton 3619 at the New York Botanical Garden, and there is fruit of this species in Case 18, tray 2, at the Chicago Natural History Museum. Common names for it are "bois lezard", "box wood", "boxwood", "fiddle wood", "fiddlewood", "schattenliebende Mullen", "West Indian boxwood", and "yellow fiddlewood". The species is attacked by the parasitic fungus *Meliola campylopoda* Syd. Fawcett reports that, according to Harrison, the wood is used for boards and framing purposes and "works up easily".

Roig reports the name "roble guiro" for this species on the authority of Maza, but it seems apparent that the Cuban plant referred to is actually *V. heptaphylla* A. L. Juss., formerly confused with *V. umbrosa*. He states further that this vernacular name is applied in Pinar del Rio also to *Catalpa punctata* Griseb., *Sebesten galeottiana* (A. Rich.) Britton, and *Vitex tomentulosa* Moldenke and in Oriente to *Turpinia paniculata* Vent., a species

of Cotema, and a species of Tabebuia. The Vitex umbrosa referred to by Fawcett (1891) as occurring in Cuba is also V. heptaphylla, since the true V. umbrosa is endemic to Jamaica. Specimens have been confused in herbaria with Tabebuia bahamensis (Northrop) Britton and Tecoma pentaphylla Juss. The Scarff 5g [Mus Yale School of Forestry 35384; F--924753], distributed as Vitex umbrosa by Standley, is actually Catalpa longissima (Jacq.) Sims.

Citations: JAMAICA: Balbis s.n. (B); Bertero 2756 (B); N. L. Britton 466 (F--201115, N), 3619 (N, N); Collector undesignated s.n. [Hooker 837] (V), s.n. (Dc, Th, Th); Cuming 42 (Bm, V); Gosse 42 (X); W. Harris 5845 (B, F--445555, N), 9453 (B, F--212351, N, N, W--524736), 10579 (K, N, W--656398), 11975 (B, Bm, Cp, Du--122619, E--791089, E--791090, F--438970, G, Gg--31498, K, K, N, P, P, S, V, W--791022), 12083 (Bm, E--806833, F--450986, G, K, N, S, W--791993), s.n. [23.VII.95] (Ol); Harris & Britton 10579 (Bm, F--243426); Herb. Liebmann s.n. (Cp); Herb. Vahl s.n. (Cp); Linden 38 (Br, Br); March 1866 (B, G, K, K); Masson s.n. (Bm); McFadyen s.n. (K); Swartz s.n. (N--photo of type, S--type, Z--photo of type); W. Wright s.n. (K); Wulfschlägel 1332 (Mu--1187).

VITEX UNIFLORA J. G. Baker, Journ. Bot. 20: 221--222. 1882.

Literature: J. G. Baker, Journ. Bot. 20: 221--222. 1882; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 76, 79, & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104 (1942) and [ed. 2], 123 & 203. 1949.

Tall shrub or small tree, to 6 cm. tall; branchlets slender, very obsoletely tetragonal or subterete, brownish, not at all sulcate, very minutely and obscurely pilosulous and resinous-squamulose on the younger parts, glabrescent in age; nodes not annulate; principal internodes 1--4 cm. long; leaf-scars rather large, sunken, not especially prominent; leaves ternate, 1-foliate, persistent; petioles slender, 3--15 mm. long, brunnescent in drying, obscurely puberulent-squamulose or glabrescent; blades chartaceous (not "subcoriaceous" as stated by Baker), obovate, 2--7.5 cm. long, 1.3--3 cm. wide, obtuse or rounded at the apex, sometimes slightly emarginate, entire, cuneate at the base, rather uniformly green and glabrous on both surfaces when mature, the immature leaves obscurely puberulent-pilose; midrib slender, flat above, very slightly subprominulous or almost flat beneath; secondaries filiform, few, about 3 per side, distant, irregular, ascending, obscure or very slightly subprominulous on both surfaces, irregularly anastomosing in shallow loops near the margins; veinlet reticulation sparse, obscure or indiscernible on both surfaces, or very slightly subprominulous above; flowers solitary, in the axils of the upper leaves, long-stalked; peduncles filiform, 2--2.5 cm. long, very minutely and obscurely puberulent-squamulose, brunnescent in drying, jointed at about the middle and there bearing a pair of linear bractlets which are persistent and 5--7 mm. long, subulate-tipped; calyx

campanulate, nigrescent-brunnescent in drying, about 5 mm. long, 4--5 mm. wide, very minutely and obscurely puberulent-pilose, its rim 5-dentate, the teeth deltoid, about 1 mm. long, erect, acute at the apex; corolla dark-red, slightly incurved, cylindric, the tube about 1.8 cm. long, or somewhat funnelform, thinly pilose and squamulose outside, about 4 mm. wide at the apex, the lobes subequal, orbicular, 4--6 mm. long; stamens slightly exserted; style slightly exserted; ovary merely glandulose, 2-celled, with 2 ovules in each cell.

The type of this endemic species was collected by Richard Baron (no. 124) in the forests of western Betsileo, Madagascar, and is deposited in the herbarium of the Royal Botanic Gardens at Kew. It is said to grow in woods on quartzite, and at an altitude of 1300 meters.

Citations: MADAGASCAR: Baron 124 (K--type, N--isotype, N--photo of type, Z--photo of type); Perrier de la Bâthie 12417 (N, P).

VITEA UNIFOLIOLATA Merr., Philip. Journ. Sci. 20: 438--439. 1922.

Literature: Merr., Philip. Journ. Sci. 20: 438--439. 1922; Merr., Enum. Philip. Pl. 3: 398. 1923; Hill, Ind. Kew. Suppl. 7: 252. 1929; Moldenke, Alph. List Common Names 3. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 63 & 104. 1942; Moldenke, Phytologia 2: 123. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 142 & 203. 1949.

Shrub or small tree, glabrous except for the inflorescence; branches somewhat tetragonal, pale-grayish, glabrous, the ultimate ones about 3 mm. in diameter; leaves 1-foliolate; petioles about 1 cm. long, glabrous; leaflet-blades coriaceous, pale-olivaceous when dry, oblong, 20--27 cm. long, 7--10 cm. wide, rather slender-acuminate at the apex, entire, rounded at the base, shiny, more or less bullate above, glabrous on both surfaces, slightly paler and densely punctulate beneath; secondaries 9--12 per side, prominent on both surfaces, curved-anastomosing; veinlet reticulation loose, very prominent; inflorescence solitary, terminal, slender, about 40 cm. long; peduncles about 6 cm. long, tetragonal, rather slender, about 2.5 mm. in diameter; primary inflorescence-branches only 1 or 2, greatly elongated, slightly pubescent; individual cymes widely scattered, few-flowered, 3--4 cm. long; calyx cupuliform, about 3 mm. long, the rim equally 5-lobed, the lobes ovate, about 0.5 mm. long, obtuse at the apex, appressed-pubescent with short hairs; corolla blue, about 11 mm. long, its tube about 5 mm. long, slightly pubescent on the outside, the lower lip 3-lobed, with the middle lobe large, orbicular, about 5 mm. in diameter, entire, glabrous, the 2 lateral lobes elliptic, rounded, about 3 mm. long, the upper lip about 2 mm. long; stamens somewhat exserted, villous below; young fruit glabrous or nearly so, enclosed by the accrescent fruiting-calyx.

The type of this species was collected by Ramos & Edayo [Philip. Bur. Sci. 37048] in forests along streams at low altitudes, Malangas, Zamboanga District, Mindanao, Philippines, on October



27, 1919, and is deposited in the herbarium of the Philippine Bureau of Science at Manila. A vernacular name is "babako".

The species is probably a member of the genus Teijsmanniodendron. Merrill says that it is closely related to Vitex clarkeana King & Gamble, which is Teijsmanniodendron hollrungii (Warb.) Kosterm., from which it differs in its very slender inflorescence, details of the corolla, such as the middle lobe of the lower lip being orbicular, entire, and glabrous, and in its glabrous and not tawny-pubescent fruits.

VITEX URCEOLATA C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 585. 1885.

Synonymy: Vitex loureirii Wight ex C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 585, in syn. 1885 [not V. loureirii Hook. & Arn., 1847]. Vitex sumatrana var. urceolata King & Gamble, Journ. As. Soc. Beng. 74: 849. 1909. Vitex heterophylla Schau. ex H. J. Lam, Verbenac. Malay. Arch. 187, in syn. 1919 [not V. heterophylla Roxb., 1814, nor Blume, 1858]. Mithradatea erecta Hort. ex Moldenke, Prelim. Alph. List Invalid Names 32, in syn. 1940. Vitex loureiri Wight ex Moldenke, Alph. List Invalid Names 54, in syn. 1942 [not V. loureiri Hook. & Arn., 1836]. Vitex sumatrana var. urceolata H. J. Lam, in herb. Vitex loureirii Hook., in herb.

Literature: C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 585. 1885; King & Gamble, Journ. As. Soc. Beng. 74: 849. 1909; H. J. Lam, Verbenac. Malay. Arch. 187 & 370. 1919; Moldenke, Geogr. Distrib. Avicenn. 41. 1939; Moldenke, Prelim. Alph. List Invalid Names 32. 1940; Moldenke, Alph. List Invalid Names 33 & 53--55. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 55--58, 60, 61, 64, 75, & 104 (1942) and [ed. 2], 128, 129, 133, 138--140, 143, 145, & 203. 1949.

Medium-sized tree, to 20 m. tall; branchlets stout, sharply or obtusely tetragonal, gray-brown or buff, not lenticellate, often with the youngest parts sulcate in drying, very minutely and obscurely pulverulent, subglabrate, or glabrous; pith rather large, white, tetragonal, solid; nodes often flattened and ampliate, plainly annulate; principal internodes 1.5--6 cm. long; leaves decussate-opposite, 3- or 5-foliolate; petioles rather slender or quite slender, 1.5--9.5 cm. long, flattened above, rounded or carinate beneath, very minutely and obscurely pulverulent or glabrate; petiolules very slender, 2--25 mm. long, the central one much longer than the lateral ones, the lowest sometimes subobsolete, deeply canaliculate-margined, obscurely pulverulent or glabrate; leaflet-blades chartaceous, dark-green above, somewhat lighter beneath, rather shiny on both surfaces, varying from obovate or oblanceolate to elliptic or oblong, the central one 3--14.5 cm. long, 1.6--7.5 cm. wide, short-acuminate or caudate at the apex (or rarely emarginate on freak leaves), entire, acute or long-attenuate and often more or less asymmetric at the base, glabrate or obscurely and minutely puberulent or pulverulent on both surfaces, usually resinous-dotted beneath, the lateral ones similar, but smaller; midrib slender, flat or subimpressed and u-

sually pilosulous above, rounded-prominent beneath; secondaries slender, 7--9 per side, arcuate-ascending, arcuately joined in many loops near the margins, prominulous on both surfaces or flattened above; vein and veinlet reticulation abundant, the larger portions often subprominulous on both surfaces; inflorescence terminal and often also in the uppermost axils, the axillary ones racemose, the terminal ones racemose or paniculate with 1 or 2 lateral racemose branches; racemes narrow and rather short, 4--11 cm. long, 1.5--2.3 cm. wide, the flowers borne in 2--11 many-flowered whorls; peduncles rather stout or slender, 1.5--5.5 cm. long, similar to the branchlets in shape, color, and pubescence, but more slender; rachis similar to the peduncle, but more densely puberulent, straight or the lateral ones curvate-ascending; pedicels slender, 1--3 mm. long, very densely griseous-puberulent; bractlets and prophylla numerous, linear, 2--4 mm. long, densely griseous-puberulent, mostly twisted and recurved or circinately coiled; fruiting-calyx patelliform, about 1 cm. wide, minutely puberulent, its rim irregularly and shallowly 5-lobed; fruit drupaceous, subglobose, about 1 cm. long and wide, apiculate.

The species is based on Maingay 1205 and 3368 and Griffith 6064 from Malacca. It is said to inhabit forests, fruiting in November. Wilson says of it "tree 60 feet tall by 10 feet", but just what he means by the latter part of this statement is not clear. Specimens have been misidentified in herbaria as Vitex heterophylla Roxb., V. heterophylla var. undulata (Wall.) C. B. Clarke, V. quinata (Lour.) F. N. Will., and V. sumatrana var. typica H. J. Lam. Actually V. heterophylla Blume is a synonym of V. pinnata L., while V. heterophylla Roxb., V. loureiri Hook. & Arn., and V. loureirii Hook. & Arn. are synonyms of V. quinata.

Citations: ANDAMAN ISLANDS: South Andaman: Ulu Buboug [King's Collector] s.n. [3-6-1893] (Bz--25162). FORMOSA: E. H. Wilson 11127 (N--photo, Ph, Z--photo). MALAYA: Malacca: Griffith 6064 (N--cotype, N--photo of cotype, S--cotype, Ut--53409--cotype, Z--photo of cotype), s.n. [Malacca, 1845] (K); Maingay 1205 (K--cotype, N--cotype), 3368 (K--cotype). Perak: Ulu Buboug [King's Collector] 10406 (K). JAVA: Koorders 9338b [220d] (Bz--24214). BORNEO: Zwaan 799 [Boschproefst. BB.18539] (Bz--25442). CULTIVATED: Germany: Herb. Hort. Bot. Berol. s.n. (B, B, K, N--photo, S--photo, Z--photo).

VITEX VANSTEENISI Moldenke, Phytologia 4: 294. 1953.

Small tree; branchlets slender, very obtusely tetragonal, white-lenticellate, densely brown-puberulent; twigs similar but even more densely brown-puberulent; nodes annulate; principal internodes 2.5--4 cm. long; leaves decussate-opposite, 1-foliolate; petioles slender, 1--4 cm. long, very densely brown-puberulent, articulate at the apex; petiolules 4--6 mm. long, densely brown-puberulent; leaf-blades chartaceous, grayish-green above, elliptic or elliptic-ovate, 5.5--15 cm. long, 2.8--6.3

cm. wide, acute or acuminate at the apex, entire, acute or very shortly acuminate at the base, densely puberulent above, less conspicuously so in age, densely short-pubescent beneath with brown velutinous hairs; midrib slender, reddish, flat or very slightly subimpressed above, prominent beneath; secondaries slender, 7--10 per side, arcuate-ascending, reddish, anastomosing near the margins, flat above, prominulous beneath; inflorescence abbreviated, apparently axillary in the uppermost axils of the twigs, cymose, much shorter than the subtending leaves; peduncles slender, 1--1.5 cm. long, very densely short-pubescent with dark-brown velutinous hairs; cymes 1--1.5 cm. long and wide, rather dense; bractlets linear, 1--2 mm. long, densely short-pubescent; calyx campanulate, its tube about 3 mm. long, very densely fulvous-pubescent, the lobes elongate, oblong, foliaceous, conspicuous, 2--3 mm. long, acute; immature corolla short-exserted, yellow, its tube cylindric, about 8 mm. long, densely puberulent; fruiting-calyx and fruit not known.

The type of this species was collected by Cornelis Gijsbert Gerrit Jan van Steenis (no. 9400) along a forest edge, at 1300 to 1500 meters altitude, between Gadjah and Blana Kedjerren (Gajo 'Lands'), northern Sumatra, on February 27, 1937, and is deposited in the herbarium of the Botanisch Museum at Utrecht. The species in its general habit reminds one greatly of V. erioclona H. J. Lam and in its calyx characters of V. longisepala King & Gamble.

Citations: SUMATRA: Van Steenis 9400 (N--isotype, N--photo of type, Ut--type, Z--photo of type).

VITEX VAUTHIERI P. DC. ex Schau. in A. DC., Prodr. 11: 690--691. 1847.

Synonymy: Besleria arborea Vell., Fl. Flum. 261 (1825), Icon. 6: pl. 82. 1827 [not Vitex arborea Roxb., 1814, nor Fischer, 1829, nor Desf., 1847]. Psilogyne multiflora A. DC. ex Moldenke, Prelim. Alph. List Invalid Names 39, in syn. 1940. Vitex sellowiana var. lundiana Hieron. ex Moldenke, Prelim. Alph. List Invalid Names 52, in syn. 1940.

Literature: Roxb., Hort. Beng. 46. 1814; Vell., Fl. Flum. 261 (1825), Icon. 6: pl. 82. 1827; Desf., Cat. Hort. Paris, ed 3, 391. 1829; Schau. in A. DC., Prodr. 11: 685 & 690--691. 1847; Schau. in Mart., Fl. Bras. 9: 300. 1851; Glaz., Mém. Soc. Bot. France 3: 547. 1909; Moldenke, Geogr. Distrib. Avicenn. 27. 1939; Moldenke, Prelim. Alph. List Invalid Names 39 & 52. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 39 & 104. 1942; Moldenke, Alph. List Invalid Names 39 & 55. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 70 & 87. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 95 & 203. 1949.

Illustrations: Vell., Fl. Flum. Icon. 6: pl. 82. 1827.

Shrub or tree; branchlets medium-slender, obtusely tetragonal or subterete (often triangular and deeply sulcate between the angles), gray, minutely puberulent, medullose, not conspicuously lenticellate; twigs slender, obtusely tetragonal, often flattened

and sulcate and slightly ampliate at the nodes, densely puberulent with cinereous or sordid-yellowish puberulence; nodes slightly annulate, often very obscurely so; principal internodes 1--8.5 cm. long; leaves decussate-opposite, 3--7-foliolate, unfolding with the flowers; petioles rather slender or occasionally stoutish, 2--9 cm. long, densely puberulent like the twigs, slightly ampliate at the base, somewhat disciform at the apex; leaflets subequal or the lower ones smaller than the central one, the two lowermost often greatly reduced, all short-petiolulate on densely puberulent deeply sulcate and margined petiolules 1--7 mm. long or the lowermost subsessile; leaflet-blades firmly chartaceous, often quite thick when mature (or even subcoriaceous), very dark-green above (usually brumescens in drying, much lighter or sordid-gray beneath, the central one narrow-elliptic, 4--13 cm. long, 1.7--4.2 cm. wide, acute or very short-acuminate at the apex, rarely obtuse, entire, acutely attenuate at the base, minutely puberulent throughout above, densely puberulent beneath with distinct sordid-gray or brownish hairs, the lateral ones similar in all respects but smaller, more shortly petiolulate, and mostly less acuminate at the apex; midrib slender, subimpressed above, prominent beneath; secondaries slender, very numerous and close together, 13--40 per side, ascending, parallel, straight, arcuately joined at the margins beneath, subimpressed above, prominent beneath; vein and veinlet reticulation rather abundant, subimpressed above, subprominent beneath; inflorescence axillary, cymose, 1.5--11 cm. long, 1--8 cm. wide, 1--4 times dichotomous, usually equaling or exceeding the petioles, loosely many-flowered, the branches widely divaricate; peduncles slender or stoutish, 3.5--8 cm. long, flattened, rather densely puberulent or very short-pubescent like the twigs and petioles, slightly ampliate at the apex and annulate with a band of denser pubescence; cyme-branches rather stout, conspicuously flattened, puberulent and annulate like the peduncles; pedicels rather stoutish, about 1 mm. long, densely puberulent or short-pubescent; bracts and bractlets often abundant, caducous, elliptic, to 1 cm. long and 3 mm. wide, simple, sessile, obtuse at the apex, densely canescent-pubescent beneath, usually nigrescent above in drying; prophylla often large and similar to the bractlets; calyx campanulate, 2--3 mm. long, about 3 mm. wide, acute at the base, densely short-pubescent, canescent, deeply 5-lobed to about the middle, obtuse, often reflexed, nigrescent within; corolla hypocrateriform, its tube broad, 5--6 mm. long, densely puberulent throughout on the outside, its limb 5-lobed, four of the lobes subequal, about 4 mm. long, and obtuse, the fifth (lowest) lobe much enlarged, about 7 mm. long, obovate-spatulate, all densely puberulent externally, the large lobe somewhat puberulent or barbellate at the base within; stamens and style exerted, projecting 3--4 mm. from the corolla-mouth; fruiting-calyx and fruit not known.

The type of this endemic species was collected by Vauthier (no. 193) near Rio de Janeiro between 1831 and 1833. The species has been confused with *V. cymosa* Bert. by Glaziov in the reference cited above and with *V. sellowiana* Cham. by herbarium work-



ers. It has been collected in anthesis from September to December. The numerous, straight, parallel, and close secondaries, impressed venation on the upper leaf-surface, and the cymes usually equaling or surpassing the petioles distinguish this species very well. The specimen of Glaziou 8830 in the Delessert Herbarium at Geneva illustrates the 3-angled branchlets often seen on this species.

Citations: BRAZIL: Federal District: A. Lutz 589 (Lz). Minas Gerais: Warming s.n. [Lagoa Santa] (V); Widgren s.n. (Ja--5988). Rio de Janeiro: Glaziou 3066 (Br, Br, Cp, Cp, K, N, N--photo, N--photo, P, P, P, Z--photo, Z--photo), 3679 (Br, G, P), 4159 (B, K, P), 4195 (Cp), 8830 (B, Cb, Cb, Cp, K, N, P, P); Vauthier 193 [Macbride photos 7882] (B--isotype, B--photo of type, Cb--isotype, Dc--type, Dc--isotype, F--870989--isotype, F--645689--photo of type, K--isotype, Kr--photo of isotype, Le--isotype, Mi--photo of type, N--photo of type, N--photo of isotype, N--photo of isotype, P--isotype, V--isotype, Z--photo of type). São Paulo: J. T. Lima s.n. [São Paulo, December 1943; Herb. Rio de Janeiro 48996] (N); Löfgren s.n. [Rio Alto Tiete, Oct. 22, 1901; Herv. Com. Geogr. e Geol. S. Paulo 5845] (N, Sp--15603, Sp). State undetermined: Bowie & Cunningham s.n. (Bm); Lund 818 [Serra de Taguahy] (Bm).

VITEX VELUTINA (Koord. & Val.) Koord., Exkursionsfl. Java 3: 137. 1912.

Synonymy: Vitex heterophylla var. velutina Koord. & Val., Bijdr. Booms. Java 7: 207--208. 1900.

Literature: Koord. & Val., Bijdr. Booms. Java 7: 204 & 207--208. 1900; Koord., Exkursionsfl. Java 3: 137. 1918; Koord. & Val., Atlas Baumart. Java 2: 6, pl. 297. 1914; Heyne, Nutt. Plant. Nederl. Ind., ed. 1, 4: 113. 1917; H. J. Lam, Verbenac. Malay. Arch. 167, 185, & 370. 1919; Heyne, Nutt. Plant. Nederl. Ind., ed. 2, 1320. 1925; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Suppl. List Common Names 11. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 64 & 104. 1942; Moldenke, Alph. List Invalid Names 53, 1942; Moldenke, Phytologia 2: 123. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 145 & 203. 1949.

Illustrations: Koord. & Val., Atlas Baumart. Java pl. 297. 1914.

Tree; branchlets tetragonal, velutinous; leaves 5-foliolate; petioles velutinous; petiolules 1--2 cm. long; leaflet-blades elliptic-oblong, membranous, the central one 10--22 cm. long, 4.5--10 cm. wide, short-acuminate at the apex, acute at the base, scabrid-punctate above, velutinous beneath, the lateral ones half as long as the central one; inflorescence paniculate, leafy toward the base, velutinous; bracts linear; calyx about 3 mm. long, sparsely pubescent outside; corolla about 1 cm. long, sparsely pubescent externally, entirely glabrous within, the tube sigmoid, the limb 2-lipped, 5-lobed.

The species is based on Koorders 20101b, 20217b, 24703b, 24779b, and 27045b, collected at Noesakembangan, Java. Common

names for it are "këtilëng" and "manebom boenga". The *Tamesis* collection cited below was previously misidentified by herbarium workers as *V. parviflora* A. L. Juss. and *V. parviflora* f. *sterilis* H. J. Lam, while the Borden collection was confused with *Viticipremna philippinensis* (Turcz.) H. J. Lam.

Citations: PHILIPPINE ISLANDS: Luzon: Borden s.n. [Herb. Philip. Forest Bur. 3059] (Bz--25369, N); *Tamesis* s.n. [Herb. Philip. Forest Bur. 11903] (Bz--24553). SUMATRA: Dirksen 10 (Bz--25370); Gusdorf 128 (Bz--25371, Er, N). JAVA: Koorders 20101b [1039c] (Bz--35375--cotype), 20217b [1127c] (Bz--25374--cotype), 24703b [1039c] (Bz--25376--cotype), 24779b [1127c] (Bz--25373--cotype), 27045b (Bz--25377--cotype, Bz--25378--cotype, Bz--25659--cotype), 40237b [1039c] (Bz--25372).

VITEX VENULOSA Moldenke, Phytologia 4: 64--65. 1952.

Tree; branches heavy, medullose, very decidedly tetragonal, densely appressed-tomentellous with ochraceous hairs, often somewhat ampliate and more compressed at the nodes; nodes annulate; principal internodes 2--6 cm. long; leaves decussate-opposite, palmately compound, 5-foliolate; petioles elongate, stout when mature, 5.5--18 cm. long, very densely appressed-tomentellous or puberulent with ochraceous hairs, club-like at the apex; leaflets rather firmly chartaceous, bright-green above, nigrescent in drying, lighter beneath, microscopically puberulous or glabrescent above, very densely tomentellous with cinereous-ochraceous hairs beneath, elliptic or broadly elliptic, acute or short-acuminate at the apex, entire, acute or rounded at the base or rarely sub-acuminate, the central ones 7--18 cm. long and 3.3--7.5 cm. wide, the basal ones much smaller; petiolules stout, 4--15 mm. long, densely puberulent; midrib rather stout, flat above, very prominent beneath; secondaries very numerous and close, 17--20 per side, spreading-ascending, parallel, not arcuate except at the very margins where they are incompletely anastomosing, flat above, prominent beneath; veinlet reticulation very abundant, flat and obscure above but very conspicuous to the smallest parts beneath and decidedly prominulous there, the tertiaries subparallel, at right angles to and connecting the secondaries; inflorescence axillary, cymose, shorter than the subtending leaves; peduncles stout, about the same diameter as the subtending petiole, 4.5--11.5 cm. long, densely ochraceous-puberulent; cymes many times bifurcate, the branches wide-spreading, loosely or densely many-flowered, densely ochraceous-puberulent throughout, the branches rather conspicuously flattened and sulcate, conspicuously annulate at the nodes; bractlets linear, 3--15 mm. long, densely puberulent; pedicels very slender, much abbreviated, usually 1 mm. long or less, densely ochraceous- or cinereous-puberulent or short-pubescent; calyx campanulate, about 2.5 mm. long and wide, densely short-pubescent with antrorse ochraceous hairs, its rim subtruncate, subentire or minutely apiculate; corolla violet, about 8 mm. long, its tube about 5 mm. long, densely short-pubescent with cinereous hairs outside; fruiting-calyx cupuliform, a-

bout 5 mm. long and 8 mm. wide, densely short-pubescent with cinereous hairs, truncate and subentire or minutely denticulate; fruit drupaceous, subglobose, about 1 cm. long and wide, glabrous, shiny.

The type of this species was collected by Jean Lebrun (no. 5878) in the forest at Lumuna, Belgian Congo, in August, 1932, and is deposited in the herbarium of the Jardin Botanique de l'Etat at Brussels.

Citations: BELGIAN CONGO: Delevoy 630 (Br, Br, N); Herman 2199 (Br, Br, Br, N, N); Lebrun 5878 (Br--type, Br--isotype, N--photo of type, Z--photo of type); Quarré 5105 (Br); Ritschaux 1568 (Br), 1569 (Br); Vanderyst 5715 (Br).

VITEX VERMOESENII DeWild., Ann. Soc. Scientif. Brux. pl. 49, sér. B, p. 66. 1929; Plant. Bequaert. 5: 16--19. 1929.

Literature: DeWild., Ann. Soc. Scientif. Brux. pl. 49, sér. B, p. 66. 1929; DeWild., Plant. Bequaert. 5: 5 & 16--19. 1929; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 87. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115 & 203. 1949.

Large tree or shrub; branches subcylindric, short-pubescent when young, glabrescent in age; leaves 5-foliolate, the central leaflet usually more developed than the rest; petioles 4.5--11 cm. long, more or less plainly canaliculate above, shortly velutinous-pubescent, more or less densely pilose at the apex; petioles 2--10 mm. long; leaflet-blades lanceolate-elliptic, 2--12 cm. long, 1.1--4.5 cm. wide, more or less long-acuminate at the apex, entire, narrowed into the petiolule at the base, glabrous above, glabrous (except for the more or less appressed-pilose venation) and densely glandulose beneath with subcircular, more or less concave, and brilliantly shiny glands; secondaries 10--14 per side; inflorescence cymose, the axillary cymes more or less branched, the branches to 4 cm. long, forming a large terminal panicle; peduncles 5--9 cm. long, short-puberulent; lower bracts lanceolate, puberulent; bractlets filiform, to 3 mm. long on the upper branches, puberulent, caducous; flowers numerous, pedicellate; pedicels about 1 mm. long, pubescent; calyx cupuliform, about 1 mm. long, puberulent, its rim shortly 5-dentate; corolla short-tubular, its tube 3--3.5 mm. long, velutinous externally, the limb 5-lobed, the upper lobe 3--3.5 mm. long and 4 mm. wide, the other lobes about 1.5 mm. long; stamens and style short-exserted; ovary subglobose, glandulose, pilose at the summit; fruiting-calyx accrescent, patelliform, about 12 mm. wide, glabrous inside, with scattered but plainly visible hairs on the outside; fruit ovoid-globulose, 1.9--2 cm. long and wide.

The species is based on Vermoesen 1742 from Temvo, Belgian Congo, collected on March 6, 1919, on Vermoesen 1933 from the same locality, collected on April 4, 1919, on de Briey 55 from Ganda-Sundi, collected in 1911, on Sparano 129 from the vicinity of Luluabourg, collected in 1913, and on Pynaert 1696 from Eala, collected in 1907. The species is undoubtedly closely related to

V. rivularis Gttrke.

DeWildeman questions whether Pieper has designated the correct specimen in the Berlin herbarium as the type collection of V. rivularis, of which Zenker 1333 is unquestionably the actual type. He states that Vermoesen distinguished the present taxon from V. rivularis by a note on a herbarium specimen reading "Aff. rivularis sed folia supra glabrescentia, subtus dense et minute punctulata. Foliola, ad venos glaberrimo vel pilis rarioribus praedita." He continues: "Chez la plante du Congo les feuilles sont en effet glabres sur la face supérieur; chez le type camerounien elles sont munies de poils allongés, plus ou moins apprimés, sur le limbe et sur les bords ciliés, plus ou moins abondants, toujours présente chez les spécimens que l'on peut rapprocher sans le moindre doute du type de Guerke, dont le sommet du pétiole commun est également à poils allongés, comme les nervures, alors que dans la forme décrite ci-dessus on ne trouve au sommet du pétiole que des poils relativement courts. La diagnose de Guerke n'a malheureusement pas attiré l'attention sur ces caractères, elle dit même: 'foliolis.....supra glabriusculis et secundum nervos pilosioribus', ce qui n'est donc pas tout à fait exact.

"Guerke ajoute à propos du calice: 'calice per anthesin cupuliforme, extus glanduloso, 5-dentato, post anthesin valde accrescente' et dans les explications en texte allemand: 'Der Kelch ist zur Blütezeit napfförmig, mit gelben Drüsen bedekt, 5-zählig; zur Fruchtzeit vergrößert er sich stark und ist dann kugelig mit flachen aber deutlichen Zähnen.....'

"L'échantillon type: Zenker n. 1333, que nous avons pu examiner ne possède pas de fleurs; des calices fructifères non à maturité sont seuls présents.

"Dans nos plantes, comme dans celles que M. Pieper...rapporte au type rivularis, le calice est velu à l'état jeune, et nous retrouvons des poils sur les calices adultes de la plante du Mayumbe. Dans celle-ci le calice sous le fruit forme un plateau ondulé sur le bord duquel les dents ne sont plus marquées.

"Il semble donc qu'il y aurait lieu de réétudier toutes ces plantes afin de faire concorder ces caractères, la présence de glandes calicinales jaunes, ne se marque guère sur le n. 1333 de Zenker, celle des granulosités de la surface de ce même organe, ne sont guère visibles à l'oeil nu, ni sur cet échantillon ni sur le document que nous renseignons sous le nom de V. vermoeseni. Par contre les poils sont très nets sur les calices fortement accrus et cela même après le détachement du fruit.

"Nous ne pouvons nous empêcher de signaler ces plantes sous un nom nouveau; il n'aura peut-être pas dans l'avenir une valeur spécifique, mais pourrait permettre de distinguer une race plus ou moins nettement définie."

DeWildeman in his *Plantae Bequaertianae* reference cited above describes the upper corolla-lobe as "9" mm. wide in his Latin diagnosis and as "4" mm. wide in his French description. In the French description he also states that the pedicels are "accrecent". Specimens of this species have been misidentified in herb-



aria as V. longipetiolata Gürke.

Citations: BELGIAN CONGO: Flamigni 4 (Br, Br, Br, N); Vermoesen 1742 (N—cotype, N—photo of cotype, S—cotype, Z—photo of cotype). LOCALITY OF COLLECTION UNDETERMINED: Herb. Jard. Colon. Lisboa 7841 (N).

VITEX VERTICILLATA A. Chev., Etud. Fl. Afr. Cent. Franç. 1: 244. 1913.

Literature: A. Chev., Etud. Fl. Afr. Cent. Franç. 1: 244. 1913; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 80. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104 (1942) and [ed. 2], 114 & 203. 1949.

Nothing is known of this species except that Chevalier states that it is a shrub 0.5--1 m. tall, with white flowers, the lower corolla-lip blue.

The type of the species is Chevalier 5490, collected in thickets between Kemo and Tomi, upper Ubangi, in Ubangi-chari, French Equatorial Africa, on September 22, 1902. Although Chevalier's description is very brief and totally inadequate, in my opinion the binomial is validly published under the present International Rules of Botanic Nomenclature.

VITEX VESTITA Wall., Numer. List [48], no. 1750, hyponym (1829); Schau. in A. DC., Prodr. 11: 692--693. 1847.

Synonymy: Vitex finlaysoniana Wall., Numer. List 215, no. 6314, hyponym. 1832. Vitex neglecta H. J. Lam in Lam & Bakh., Bull. Jard. Bot. Buitenz., sér. 3, 3: 63. 1921. Vitex neglecta var. puberula H. J. Lam in Lam & Bakh., Bull. Jard. Bot. Buitenz., sér. 3, 3: 63. 1921. Vitex vestita var. neglecta H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5: 176. 1922. Vitex vestita var. neglecta f. puberula H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5: 176. 1922. Vitex vestita var. genuina H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5: 176. 1922. Vitex lanceolata P'ei, Mem. Sci. Soc. China 1 (3) [Verbenac. China]: 114. 1932. Vitex vestita var. glabrior Teijsm., in herb. [not V. vestita var. glabrior H. J. Lam]. Vitex vestita f. glabrior Teijsm., in herb.

Literature: Wall., Numer. List [48], no. 1750 (1829) and 215, no. 6314. 1832; Schau. in A. DC., Prodr. 11: 692--693. 1847; Miq., Fl. Ind. Bat. 2: 864. 1856; Miq., Fl. Ind. Bat. Suppl. 1: 242 & 568. 1860; Kurz, For. Fl. Brit. Burma 2: 272. 1877; C. B. Clarke in Hook. f., Fl. Brit. Ind. 4: 587. 1885; F. N. Will., Bull. Herb. Boiss., sér. 2, 5: 431. 1905; King & Gamble, Mat. Fl. Malay Penins. 854. 1905; King & Gamble, Journ. As. Soc. Beng. 74: 854. 1909; Heyne, Nutt. Plant. Nederl. Ind., ed. 1, 4: 117. 1917; H. Hallier, Meded. Rijks Herb. Leid. 37: 54. 1918; H. J. Lam, Verbenac. Malay. Arch. 169, 205--206, & 370. 1919; H. J. Lam in Lam & Bakh., Bull. Jard. Bot. Buitenz., sér. 3, 3: 60 & 63. 1921; H. J. Lam, Bull. Jard. Bot. Buitenz., sér. 3, 5: 176. 1922; Ridl., Fl. Malay Penins. 635. 1923; Heyne, Nutt. Plant. Nederl. Ind., ed. 2, 1320. 1925; P'ei, Mem. Sci. Soc. China 1 (3) [Verbenac. China]:

112 & 114. 1932; Dop, Fl. Gén. Indo-chine 4: 839. 1935; Fletcher, Kew Bull. 1938: 436. 1938; Moldenke, Suppl. List Common Names 2--4, 6, 7, 9, 11, 13--15, 18, 19, 21, & 23. 1940; Moldenke, Prelim. Alph. List Invalid Names 50. 1940; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 55--57, 60, 61, 64--66, & 104. 1942; Moldenke, Alph. List Invalid Names 53. 1942; Moldenke, Phytologia 2: 123. 1944; H. N. & A. L. Moldenke, Pl. Life 2: 59. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 128, 129, 133, 138--140, 144--146, 148, & 203. 1949.

A moderate-sized or shrubby tree, 6--32 m. tall; trunk to 10 cm. in diameter; branchlets round, softly pubescent with grayish-tawny hairs; leaves 3-foliolate; petioles 3.5--10.5 cm. long, softly pubescent with grayish-tawny hairs; leaflet-blades chartaceous, lanceolate, acuminate at both ends, entire, sparsely puberulent above, denser on the venation, tomentose and glandular beneath, the central one 11.5--19 cm. long, 5--10 cm. wide, on a petiolule 1.5--6 mm. long, with 8--10 secondaries, the lateral ones 8--16 cm. long, 4--6.5 cm. wide, often asymmetric at the base, on petiolules 5--10 mm. long, with 5--7 secondaries; cymes in the upper leaf-axils, softly pubescent with gray-tawny hairs, usually 2--4 arranged in vertical fashion in each axil, dichotomous, 2.5--6 cm. long and wide; peduncles 0.7--2.5 cm. long, softly pubescent; flower-buds yellowish-green; flowers slightly fragrant; calyx yellowish-green, cupuliform or subcylindric, subbilabiate, about 3 mm. long and 2 mm. wide, pubescent and glandulose outside, glabrous within, its rim 5-dentate, the teeth small, deltoid; corolla varying from white to yellow or lemon-yellow, its tube cylindric, slender, about 8 mm. long and 1 mm. wide, densely glandular (except at the base) with rather large yellow glands or glanduliferous hairs, glabrous within except for a ring of stiff antrorse hairs about 2.5 mm. from the base within, the limb 5-lobed, the lobes subequal, 1--1.5 mm. long, ovate, densely glandular with rather large yellow glands or glanduliferous hairs, sometimes somewhat pilose on the back, glabrous above; stamens subequal, included, glabrous, inserted about 5 mm. from the base of the corolla-tube, about 4 mm. long; anthers whitish, the thecae light-brown; pistil whitish; style slender, about 1 cm. long; stigma light-green, very shortly bifid; ovary yellow, orange toward the base, glabrous and subcylindric at the base, abruptly narrowed into a glandular-dotted beak at the apex; fruit drupaceous, reddish-brown, globose, about 6 mm. long and wide, the lower 1/3 included by the somewhat enlarged fruiting-calyx.

The type of this species was collected by Nathaniel Wallich [né Nathan Wolff] (no. 1750) at Taong-Dong Avae [or "Toong", according to Schauer], Penang, Malaya. The type of *V. lanceolata* is *A. Henry* 11883a from Yunnan, China, while that of *V. neglecta* var. *puberula* is *Ajoeb* 182, collected on the Jacobson Expedition to Sumatra at Rimbo Pengadang, at an altitude of 1000 meters, on April 16, 1916. *V. neglecta* var. *genuina* was based on *Clemens* 11172 and 9813 from British North Borneo, *Horsefield* s.n. from

Java, Teijsmann 1158, 1165, and 2671 from Sumatra, and Mutkiah 7742 from Johore, plus, according to Lam, the specimens cited by him in his 1921 work, viz., Scheffer s.n. from Java, Teijsmann s.n. from Muntok, and Buurman van Vreeden 159 from Sumatra.

Dr. Lam cites Wallich's Numerical List nos. 1750 and 6314 both as "1828", but the former was published first in 1829 and the latter in 1832, according to Dr. John H. Barnhart, noted botanic bibliographer. Heyne says of the wood of this species "Het lichte, witachtig reekleurige hout wordt gebruikt voor daksparrren en brandhout; het is veel minder in kwaliteit dan dat van V. pubescens, Vahl (Ridley, Mal. Timmerhoutsoorten, bl. 84)".

Lam separates his var. neglecta on the calyx being distinctly 2-labiate, the lower lip 2-dentate, the upper lip more or less elongate, 1--2 mm. long, while in the typical form of the species the calyx is subregular, minutely 5-denticulate, the lower lip 2-denticulate, the upper lip entire or very minutely 3-denticulate. He says that the central petiolules are 1.5--6 cm. long, but this is probably a misprint for "mm."

The Bemmel 11 cited below is anomalous, with very obtuse leaflets, but is still very immature. The species is said to be very common on dry land in Sumatra and also inhabits the edge of open marshy ground and the edges of jungles, from 150 to 5000 feet elevations. It has been collected in anthesis in January, April, May, and December, and in fruit in June and October. Common names recorded for it are "alaban baengat", "bangas jantan", "black lëban", "bôti-bôti", "chichah", "flowery lëban", "halban", "haleban", "halëban", "horn lëban", "kajoe djokkal isap", "kaju berebah", "kepayan", "lëban", "lëban bunga", "lëban hitam", "lëban kunyit", "lëban nasi", "lëban nasi-nasi", "lëban nasi rimba", "lëban pelandok", "leban tandok", "lëban tandok", "maramboeëng", "maramboeeng", "marambuëng", "mouse-deer's lëban", "rice lëban", "sepit", "sepit", "tampang besi", "tampang bësi", and "tumeric lëban". It is of interest to note that "black leban", "halëban", "lëban hitam", and "lëban nasi-nasi" are also applied to V. pinnata L.; "lëban nasi" is applied also to V. gamosepala Griff.; "halban", "lëban kunyit", and "tumeric lëban" apply also to V. pinnata and V. longisepala King & Gamble; "horn lëban" and "leban tandok" are applied also to V. pinnata and V. quinata (Lour.) F. N. Will.; "lëban" is applied also to V. negundo L. and V. pinnata; "flowery lëban" and "lëban bunga" apply also to V. longisepala, V. pinnata, and V. quinata; and "tampang bësi" is applied also to Callicarpa candicans (Burm. f.) Hochr., C. longifolia Lam., and C. maingayi King & Gamble.

Lam cites Ploem s.n. (Le--90927-27) and Blume s.n. (Le--908267-628) from Java and Korthals s.n. (Le--908266-786, Le--908266-787, Le--908266-755) and H. Bog. 1158, 1165, and 3671 from Sumatra, Fletcher cites Kerr 6238 and Schmidt 434 from Thailand. Hallier cites Korthals s.n. from Sumatra and Beccari 1633 from Sarawak.

Citations: INDIA: Assam: Bor 4446 (K). CHINA: Yunnan: A. Henry

11883a (N, N, N--photo), 11883b (N), 12310a (N), 12310b (N), 13651 (N, N, N--photo). INDOCHINA: Laos: Pételot 4537 (N). KOH CHANG ISLAND: E. J. Schmidt 294 (S). MALAYA: Johore: Holttum 9212 (Bz--25397); Nur & Kiah bin Hadji 7742 (Bz--25398). Malacca: Cuming 2351 (V); W. Griffith s.n. [1845] (Br, Br). Negri Sembilan: Nur 11508 (Bz--25405). Pahang: M. R. Henderson 23407 (Bz--25403, N). Penang: Wallich 1750 (Cb--isotype, Cb--isotype, N--photo of isotype, T--isotype, Z--photo of isotype), 1750b (M, S). Singapore: Herb. Mus. Palat. Vindob. 2483 (V); Liew 405 [Singapore field no. 36496] (Bz--25402). LINGGA ARCHIPELAGO: Lingga: Brunnermeijer 6963 (Bz--25399, Bz--25400). SUMATRA: Ajoeb 182 (Bz--25383, N--photo, Z--photo); Anta s.n. [Kostermans 608] (Bz--72943); Boeea 7049 (S), 9827 (N); Buurmann van Vreeden 159 [Herb. Bot. Variorum Hort. Bogor. 159] (Bz--25414, Bz--25415); Endert 9 [Boschproefst. E.1210] (Bz--25424), E.813 (Bz--25384, Bz--25385); Krukoff 319 (Bz--25425), 4117 (Br, Bz--25416, N); Teijsmann 1158 H.B. (Bz--25422, Ut--44159), 1165 H.B. (Bz--25420, Bz--25421, Ut--44156, Ut--44157), 3671 H.B. (Bz--25419, Ut--44158); Toroos 284 (N, S), 1236 (N), 4238 (N), 4497 (N); Voogd 544 (Bz--25411, Bz--25412); Yates 1648 (Bz--25417, Bz--25418, N), 2140 (Bz--25423, N). JAVA: Horsfield s.n. [Java, 1862-1918] (Bz--25426); Scheffer s.n. [Bogor] (Bz--25427). BRITISH NORTH BORNEO: M. K. Clemens 11172 (N--photo, Ph, Z--photo); Clemens & Clemens 26679 (N), 29768 (Bz--25386, N), 29999 (N). LESSER SUNDA ISLANDS: Banka: Anta 755 (Bz--73024); Teijsmann s.n. [Bangka] (Bz--25406, Bz--25407, N). Muntok: Teijsmann s.n. [Muntok] (Bz--25408, Bz--25409). Timor: Bemmel 11 [Boschproefst. BB.6947] (Bz--25438). CULTIVATED: Java: Herb. Hort. Bogor. XI.J.11 (Bz--25410, Bz--25676), XI.K.6 (Bz--26577). LOCALITY OF COLLECTION UNDETERMINED: Herb. Martius s.n. (Br).

VITEX VESTITA f. GLABRESCENS Moldenke, Phytologia 3: 489. 1951.

This form differs from the typical form of the species in having the lower leaf-surfaces, petioles, branchlets, and inflorescences glabrous or subglabrescent.

The type of the form was collected by Rahmat Si Toroos (no. 4698) along the Aek Roppak, near Hoeta Imbaroe (topographic sheet 41, northwest quarter), subdivision Padang Lawas, division Padang Si Dimpoean, Tapianoei, Sumatra, between June 22 and 30, 1933, and is deposited in the Britton Herbarium at the New York Botanical Garden. It is described as a treelet.

Citations: SUMATRA: Toroos 4698 (N--type), 5230 (N).

VITEX VESTITA f. MILLSII (Henderson) Moldenke, Phytologia 3: 489. 1951.

Synonymy: Vitex millsii Henderson, Journ. Asiat. Soc. Malaya 5: 262. 1927.



Literature: Henderson, Journ. Asiat. Soc. Malaya 5: 262. 1927; Fedde, Bot. Jahresber. 59 (2): 417. 1939; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 61 & 103. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 72. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 139 & 201. 1949.

This form differs from the typical form of the species in having the inflorescence spreading-pubescent and the leaves glabrous above, spreading-pubescent on the midrib beneath, otherwise glabrous.

The type of the form was collected by Murray Ross Henderson (no. 17958) at 4500 feet elevation at Robinson Falls, Cameron's Highlands, Pahang, Malaya, on November 24, 1925. It is named in honor of G. R. Mills, an English planter at Batu Gajah, Pahang, where he collected plants around the year 1925.

Citations: MALAYA: Pahang: M. R. Henderson 17958 (Bz--25404--isotype, N--isotype, N--photo of isotype, Z--photo of isotype).

VITEX VESTITA var. SIAMICA Moldenke, Phytologia 4: 65. 1952.

This variety differs from the typical form of the species in having its leaflets only 2.5--8 cm. long and 1--3.5 cm. wide at time of anthesis, more or less serrate along the margins, and the short pubescence confined to the venation only beneath.

The type of the variety was collected by Kasin (no. 346) on a rock at Tripagodas, about 40 km. north of Wagka, on the Burmese border, Thailand, on May 14, 1946, and is deposited in the Herbarium Bogoriense at Buitenzorg. It is known thus far only from the original collection.

Citations: THAILAND: Kasin 346 (Bz--73302--type, N--isotype, N--photo of type, Z--photo of type).

VITEX VESTITA f. WINKLERI Moldenke, Phytologia 3: 489--490. 1951.

This form differs from the typical form of the species in having its lower leaf-surfaces, petioles, branchlets, and inflorescences merely finely puberulous.

The type of the form was collected by Hubert Winkler (no. 2433) -- in whose honor it is named -- in southeastern Borneo on June 13, 1908, and is deposited in the Herbarium Bogoriense at Buitenzorg. It has been confused in herbaria with V. vestita var. genuina H. J. Lam.

Citations: SUMATRA: Toroes 1497 (N, S). BRITISH NORTH BORNEO: M. S. Clemens 9813 (Bz--25389), 11172 (Bz--25388); Clemens & Clemens 26679 (Bz--25390, Bz--25391, N), 29999 (Bz--25387). BORNEO: Winkler 2433 (Bz--25401--type, N--photo of type, Z--photo of type).

VITEX VILLOSA Sim, For. Fl. & Res. Port. East Afr. 93, pl. 78B. 1909.

Literature: Sim, For. Fl. & Res. Port. East Afr. 93, pl. 78B. 1909; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 49, 66, & 85. 1928; Stapf, Ind. Lond. 6: 479. 1931; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104 (1942) and [ed. 2],

121 & 203. 1949.

Illustrations: Sim, For. Fl. & Res. Port. East Afr. pl. 78B. 1909.

Medium-sized tree; young parts of the stem densely and closely hirsute; branches thick; leaves opposite; petioles 7—15 cm. long, pubescent; leaflets 5, sessile, obovate, 8—12 cm. long, 6—9 cm. wide, acute or obtuse at the apex, pubescent above, paler and densely villous beneath; cymes axillary, equaling the leaves, many-flowered; fruit about 2 cm. long and almost as wide, said to be edible, fleshy, set in the dilated fruiting-calyx.

The species is based on Sim 5572, said to be frequent from Quelimane northward in Portuguese East Africa, and there called "imporo". It seems very probable to me that this plant is conspecific with V. payos (Lour.) Merr., to which Pieper says it is closely related.

VITEX VOLKENSII Gürke in Engl., Pflanzenw. Ost-Afr. C: 339. 1895.

Synonymy: Vitex guerkeana DeWild., Ann. Mus. Congo, sér. 5 [Fl. Bas- & Moyen-Congo] 3: 129 (1909) and 467. 1912 [not V. guerkeana Hiern, 1900, nor Engl., 1916, nor H. H. W. Pearson, 1928]. Vitex discoideo-glandulosa DeWild., Plant. Bequaert. 5: 10—11. 1929.

Literature: Gürke in Engl., Pflanzenw. Ost-Afr. C: 339. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 318. 1900; Thiselt.-Dyer, Ind. Kew. Suppl. 2: 194. 1904; DeWild., Ann. Mus. Congo, sér. 5 [Fl. Bas- & Moyen-Congo] 3: 129 (1909) and 467. 1912; Prain, Ind. Kew. Suppl. 4: 248. 1913; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 42, 53, & 85. 1928; DeWild., Plant. Bequaert. 5: 10—11. 1929; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49, 50, & 104. 1942; Moldenke, Alph. List Invalid Names 53. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 62 & 88. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115, 117, 118, & 203. 1949.

Tree, shrub, or liana (?); stems subcylindric, short-pubescent and longitudinally fissured when mature, more densely tomentose and subtetragonal when young; branchlets yellowish-pubescent; leaves 3- or 5-foliolate; petioles 4—6.5 cm. long, tomentose, leaving a short spur on the branch when falling off; leaflets subsessile or distinctly petiolulate; petiolules to 13 mm. long on the central leaflets; leaflet-blades oblong or elliptic, moderately firm-textured, acute to more or less long-acuminate at the apex (the acumen subobtuse), apiculate, entire, rather long-cuneiform at the base, slightly shiny, scabrous or slightly pubescent above, slightly tomentose along the larger veins, paler and more densely pubescent or lanate beneath, with numerous discoid glands subimmersed in the lamina, the central blade 7.5—10 cm. long and to 4 cm. wide, the others distinctly inequilateral with one half of the blade ending 5 mm. above the other, 3.5—8 cm. long, 1.6—3.3 cm. wide, the lowest leaflets smallest; inflorescence terminal, branched, tomentose-velutinous, its cymes forming an ample thyrsoid panicle to 20 cm. long; pedicels to 1 mm. long, tomentose, accrescent in the fruiting stage; calyx cam-

panulate or subcampanulate, 1.5--3 mm. long, the teeth small, deltoid, acute at the apex, much shorter than the tube; corolla white, its tube pubescent, twice as long as the calyx, the lobes small and orbicular; stamens included; fruiting-calyx cupuliform, 5--6 mm. wide; fruit subglobose, about 5 mm. wide (possibly not mature?).

The type of this species was collected by Georg Ludwig August Volken (no. 132) -- in whose honor it is named -- at Nderema, Usambara, Tanganyika Territory. Pieper cites in addition Gillet 1973 and s.n. and Claessens s.n. from Belgian Congo. The species is said to inhabit gallery forests, blooming in December, and a vernacular name for it is "kasambankusu". The two Mearns collections cited below are 3-foliolate, certainly conspecific, but are placed here tentatively. They are from an altitude of 2000 meters. The species was originally described as having only 5-foliolate leaves.

V. discoideoglandulosa was proposed by DeWildeman as a new name for his V. guerkeana when he discovered that the latter was a later homonym and therefore invalid. He cites the following collections: (1) Gillet 1973 from the vicinity of Kimuenza, Belgian Congo, collected in January, 1901, (2) Gillet s.n. from the vicinity of Léopoldville, collected in 1902, (3) Claessens s.n. from Bene-Dibele, collected in December, 1909, (4) Sapin s.n. from between Lubus and Bena-Makima, collected in May, 1910, and (5) Gillet s.n. from the right bank of the Sele at Kibimbi, collected in 1926. He states that he does not accept Pieper's fusion of this species with V. volkensii "et comme la plante que nous avons décrite est franchement occidentale, l'échantillon le plus oriental provient de Bena Dibele, à l'ouest de la région du Katanga, nous conservons séparé ce type.... Nous attirons l'attention sur la glandulosité de la face inférieure des feuilles, caractère non signalé, et sur le pétiole très net des folioles, décrites par le V. volkensii..... par M. Baker comme subsessiles."

Citations: BELGIAN CONGO: Gillardin 305 (Br, Br, Br); Lebrun 6522 (Br, Br, N), 6652 (Br, Br, N, N--photo, Z--photo). TANGANYIKA TERRITORY: Scheffler 199 (N, N--photo, Po--63441); Schlieben 5910 (N, S). KENYA: Mearns 262 (W--630276), 269 (W--630284).

VITEX VONDROZENSIS Moldenke, Phytologia 4: 294--295. 1953.

Literature: Moldenke, Phytologia 4: 294--295. 1953; Harman, AETFAT Index n.p. 1954; Moldenke in Humbert, Fl. Madag. 174: 121--123 & 273, pl. 18, fig. 7 ["4"]. 1956.

Illustrations: Moldenke in Humbert, Fl. Madag. 174: pl. 18, fig. 7 ["4"]. 1956.

Tree, 5--6 m. tall; trunk about 8 cm. in diameter; branchlets and twigs very slender, grayish, very densely puberulent or short-pubescent when young, less so in age, very obtusely tetragonal; nodes annulate on older wood; principal internodes 1--5 cm. long; leaves decussate-opposite, 1-foliolate; petioles very

slender or subfiliform, 5—8 mm. long, densely brown-puberulent or short-pubescent, articulate at the apex; petiolules obsolete; blades subcoriaceous, uniformly gray-green on both surfaces, elliptic, 2.5—5.5 cm. long, 0.8—2 cm. wide, long-acuminate at the apex, entire, sometimes subrevolute in drying, attenuate-acute at the base, glabrous above, very finely puberulous beneath; midrib very slender, impressed above, sharply prominent beneath; secondaries filiform, few, 4 or 5 per side, obscure or indiscernible above, very finely subprominulous beneath, plainly arcuately joined several mm. from the margins in several loops; veinlet reticulation indiscernible on both surfaces; inflorescence cymose, axillary, equaling or exceeding the subtending leaves; peduncles filiform, divergent, 1.5—2 cm. long, densely brown-puberulent or short-pubescent; cymes usually 3-flowered; pedicels filiform, 6—9 mm. long, densely brown-puberulent; bracts lanceolate, foliaceous, conspicuous, few, about 1 cm. long and 2 mm. wide, puberulent; calyx campanulate, its tube 4—5 mm. long, densely puberulent outside, the 5 foliaceous ovate-lanceolate lobes 8—9 mm. long, long-attenuate to the apex, finely puberulent on the outside; corolla very zygomorphic, red, the tube infundibular, sharply curvate, densely puberulent externally, about 3 mm. wide at the base and 7 mm. wide at the apex, 2—2.5 cm. long, the lobes very small, about 3 mm. long, obtuse; stamens short-exserted from the corolla-tube; fruiting-calyx and fruit not known.

The type of this species was collected by Raymond Decary (no. 4888) at Vondrozo, near Farafangana, Madagascar, on September 4, 1926, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. The collector records the common name "hazomamo". It is known thus far only from the original collection.

Citations: MADAGASCAR: Decary 4888 (N--isotype, N--photo of type, P--type, Z--photo of type).

VITEX WATERLOTI Danguy, Bull. Mus. Hist. Nat. Paris 30: 508—509. 1924.

Synonymy: *Vitex waterlooti* Danguy ex Moldenke in Humbert, Fl. Madag. 174: 135, sphalm. 1956. *Vitex waterlotii* Danguy ex Moldenke in Humbert, Fl. Madag. 174: 273, sphalm. 1956.

Literature: Danguy, Bull. Mus. Hist. Nat. Paris 30: 508—509. 1924; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 79 & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 53 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 88. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 123 & 203. 1949; Moldenke in Humbert, Fl. Madag. 174: 133—136 & 273, pl. 21, fig. 3—5. 1956.

Shrub or tree, 3—5 m. tall; branchlets very stout, obtusely tetragonal, often sulcate between the angles, very medullose, very densely villous-tomentose with golden or flavescent hairs, becoming more sordid-griseous in age; nodes not annulate; principal internodes 1—5 cm. long; leaf-scars large, almost circular, more or less sunken or impressed, with densely tomentose-pubes-



cent prominent margins; leaves decussate-opposite, 5--7-foliolate; petioles very stout, 12--14 cm. long when mature, very densely villous-tomentose with golden hairs; leaflets sessile or subsessile [not petiolulate as stated by Danguy], unfolding with the flowers and mostly quite immature then, thick-textured (very conspicuously so when immature, merely thick-chartaceous in age), elliptic (not oblong as stated by Danguy), 8--20 cm. long when mature, 5--8 cm. wide when mature, mostly very obtuse or rounded at the apex when mature, rarely acute or short-apiculate, entire, revolute along the margins when mature, long-acuminate or attenuate at the base into pseudo-petioles, rather bright-green and pubescent above, very densely villous-tomentose with golden or flavescent hairs beneath, especially when young; midrib very stout on immature and on mature leaflets, impressed above and very coarsely prominent beneath, very densely villous-tomentose beneath; secondaries slender, close, regular, 15--18 per side, ascending, hardly at all arcuate, impressed above, prominent and densely golden-tomentose beneath, joined in many loops at the very margins; veinlet reticulation very abundant, rather deeply impressed above and prominent beneath; inflorescence axillary, on the youngest parts of the branchlets, appearing with the leaves, conspicuously pedunculate, the cymes many-flowered, extremely densely congested and capitate, with a Calliandra-like aspect when in anthesis, conspicuously cernuous; peduncles very stout, 2--10 cm. long, very densely villous-tomentose with golden or flavescent hairs; cymes mostly once furcate, each branch 5--10 mm. long, very stout and very densely tomentose like the peduncle, the remaining branches and pedicels suppressed, imparting a 2-headed appearance to the inflorescence; bractlets numerous, linear, stout, 10--30 mm. long, terete, very densely tomentose or lanate on both surfaces throughout, sometimes not conspicuous during anthesis but conspicuous in fruit and then surpassing the fruiting-calyx and fruit; flowers sessile; calyx campanulate, about 7 mm. long, densely lanate-tomentose with golden or flavescent hairs externally, glabrous within, the rim deeply 5-dentate or -lobed, the lobes lanceolate, unequal, about 4 mm. long, attenuate-acute at the apex; corolla tubular, slightly incurved, about 15 mm. long, glabrous at the base externally, lanuginous toward the apex, with gland-tipped hairs interspersed, glabrous within, the limb 5-lobed, the lobes ovate, 3--4 mm. long, slightly unequal, acute at the apex; stamens 4, rarely 5, about 2.5 cm. long, long-exserted and very conspicuous during anthesis; filaments subulate, glabrous, inflated and villous at the base, inserted above the lowest quarter of the corolla-tube; anthers ovate, introrse, 2-celled; pistil glabrous; style filiform, 2.5--3 cm. long, bifid at the apex; ovary globose, 4-ovulate; fruiting-cymes very densely capitate; fruiting-calyxes closely congested, densely canescent-lanate; fruit drupaceous, subglobose, about 5 mm. long and 4 mm. wide, glabrous, much wrinkled in drying.

The type of this most amazing species was collected by Georges Waterlot (no. 389) -- in whose honor it is named -- at Ambilombé,

Diego Suarez, Madagascar, and is deposited in the herbarium of the Muséum National d'Histoire Naturelle at Paris. A vernacular name is "tananakomba". It is said to inhabit hills and limestone plateaus, dry hills, and tropophilous forests, at altitudes of 10 to 250 meters. It has been collected in August, December, and January.

Citations: MADAGASCAR: Humbert 18893 (P); Perrier de la Bâthie 10253 (N, P), 18784 (P); Waterlot 389 (N—photo of type, P—type, Z—photo of type).

VITEX WELLENSI DeWild., Plant. Bequaert. 5: 19--20. 1929.

Literature: DeWild., Plant. Bequaert. 5: 19--20. 1929; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 49 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 88. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 115 & 203. 1949.

Liana; branches tetragonal, glabrescent below, alate, the wings to 2 mm. wide; leaves 3-foliolate, the central leaflet somewhat larger and always longer petiolulate than the lateral ones; petioles 7.5--15 cm. long, glabrous, more or less plainly canaliculate above, subalate along the margins; petiolules 5--25 mm. long; leaflet-blades lanceolate or elliptic-lanceolate, more or less long-acuminate at the apex, entire, 15--17 cm. long, 5.5--9.5 cm. wide, glabrous and shiny above, paler and glabrous beneath but marked with very numerous subimpressed glands, the central one more or less long-cuneiform at the base, the lateral ones rounded and subcordate at the base; secondaries 6 or 7 per side; inflorescence axillary, 9--21 cm. long, the cymes spiciform, 3- or 4-flowered, lax, more or less branched, the branches tetragonal, dichotomous, to 2.5 cm. long, glabrous or very short-pubescent, the rachis sub-tetragonal; bractlets filiform, to 2.5 mm. long; pedicels 1--15 mm. long, sparsely short-pilosulous; calyx campanulate, 1.5--2 mm. long, sparsely pilosulous externally, its rim short-dentate or entire; corolla short-tubular, the tube about 3 mm. long, short-pubescent with glandular hairs outside, glabrous within, hairy in the throat, the limb 5-lobed, the anterior lobe cuneate, entire, about 2.5 mm. long and wide, the remainder much smaller; ovary ovoid-lageniform, glandulose and sparsely pilose at the apex; infructescence to 30 cm. long; fruiting-calyx accrescent, to 6 mm. wide; fruit subglobose, about 7 mm. long and 8 mm. wide, apiculate at the apex.

The species is based on five collections from Belgian Congo: (1) collected by Frederic Wellens (no. 110) -- in whose honor it is named -- at Kanga on April 30, 1921, (2) Vermoesen 1556 from Temvo, collected June 17, 1919, (3) Vermoesen 1652 from Temvo, collected February 25, 1919, (4) Briey s.n., collected in a forest in the vicinity of Ganda-Sundi in 1903, and (5) Gillet s.n. from the region of Kisantu, collected in 1909. It is called in the vernacular "mbamba" and "nsinga-kinzinze", and is a member of the subgenus Euvitex, section Axillares, subsection Paniculatae, related to V. agelaefolia Mildbr.

Citations: BELGIAN CONGO: Vermoesen 1652 (N--cotype, N--photo

of cotype, S--cotype, Z--photo of cotype).

VITEX WELWITSCHII Gürke in Engl., Bot. Jahrb. 18: 166. 1894.

Synonymy: Vitex species arborea Welw., Apont. Phyto-geog. Angola 585. 1858. Vitex lomiensis Mildbr. in Von Mecklenb., Ergebn. Deutsch. Zentral-Afr. Exped. 2: 80, hyponym. 1910--1911.

Literature: Welw., Apont. Phyto-geog. Angola 585. 1858; Gürke in Engl., Bot. Jahrb. 18: 166. 1894; Hiern, Cat. Afr. Pl. Welw. 4: 835. 1900; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 329. 1900; Mildbr. in Von Mecklenb., Ergebn. Deutsch. Zentral-Afr. Exped. 2: 80. 1910--1911; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 50, 69, & 85. 1928; DeWild., Plant. Bequaert. 5: 20--21. 1929; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48, 49, 51, & 104. 1942; Moldenke, Alph. List Invalid Names 54. 1942; Robyns, Fl. Sperm. Parc Nat. Albert 2: 140--141. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 89. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 114, 115, 119 & 203. 1949.

Small tree or shrub, 3--6.5 m. tall; branches short-pubescent; leaves 5-foliolate; petioles 5--7.5 cm. long; petiolules short; leaflet-blades moderately firm or rigid, obovate-cuneate, conspicuously cuspidate at the apex, entire, green and glabrous above when mature, finely pubescent beneath, the central one 7.5--10 cm. long and 3.7--5 cm. wide; cymes axillary, dense, many-flowered, short-pedunculate; calyx campanulate, about 2 mm. long, densely pubescent, its teeth 1--2 mm. long; corolla small, violet or mauve-white; ovary elongate, pubescent-glandulose; fruit axillary, green, long-pedicellate, spherical but laterally compressed, about 3 cm. long and 2.5--3 cm. wide.

The type of this species was collected by Frederick Martin Joseph Welwitsch (no. 5644) -- in whose honor it is named -- in the province of Golungo Alto, Angola. It is said to be found in climax coastal bushland with Spirostachys, Pteleopsis, Croton, Acacia, and much Usnea, as well as in open forests at 4000 feet altitude. It has been collected in flower in February and March, and in fruit in May and July. It has been confused in the past with and misidentified as V. milanjiensis Britten and V. grandifolia var. bipindensis (Gürke) Pieper. Robyns cites in addition Mildbraed 2731 from Semliki plain, collected in February, 1908, while Pieper cites this and also Mildbraed 5329 and 8753 from Lombie and Dendeng and Schlosser 11 from Lombie, Cameroons.

Citations: BELGIAN CONGO: Louis 11490 (N, S); Quarré 1203 (Br). TANGANYIKA TERRITORY: Pole-Evans s.n. (N--photo). NORTH-ERN RHODESIA: Herb. Queen Victoria Memorial 8322 (N, Rh); Pole-Evans 2886 [43] (Rh), 3043 [50] (Rh). SOUTHERN RHODESIA: N. C. Chase 4191 [Govt. Herb. Salisbury 35449] (Bm, N). PORTUGUESE EAST AFRICA: Lourenço Marques: Hornby 2526 (N, Rh--515147).

VITEX WELWITSCHII var. LAURENTII (DeWild.) Pieper in Engl., Bot.

Jahrb. 62, Beibl. 141 ["142"]: 69--70. 1928.

Synonymy: Vitex laurentii DeWild., Etud. Fl. Bas- & Moyen-Congo 4: 129 (1909) and 255. 1910. Vitex bracteosa Mildbr. in Von Mecklenb., Ergebn. Deutsch. Zentral-Afrik. Exped. 2: 62, hyponym. 1910--1911.

Literature: DeWild., Etud. Fl. Bas- & Moyen-Congo 4: 129 (1909) and 255. 1910; Mildbr. in Von Mecklenb., Ergebn. Deutsch. Zentral-Afrik. Exped. 2: 62. 1910--1911; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 69--70 & 85. 1928; DeWild., Plant. Bequaert. 5: 20--21. 1929; Moldenke, Alph. List Invalid Names 52 & 53. 1942; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48, 49, & 104. 1942; Robyns, Fl. SpERM. Parc Nat. Albert 2: 141. 1947; H. N. & A. L. Moldenke, Pl. Life 2: 68. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 114, 115, & 203. 1949.

This variety differs from the typical form of the species in its more lax inflorescences, which have mostly narrower bractlets on their uppermost branches and which are located in the axils of the young leaves as well as of the old already-shed leaves, while in the typical form they are located only on the young parts of the branches or are only singly scattered below.

The variety is not, in my opinion, a very distinct one and should perhaps be reduced to synonymy under the typical form of the species, as suggested by DeWildeman in 1929. It is said to be a large or small tree, with a short trunk 60--80 cm. in diameter and 1.5 meter in circumference; the wood very durable and little attacked by termites; the corolla violet or pale yellowish-white; and the fruit edible. It inhabits forests, riverbanks, and the margins of water, and has been collected in February to April, November, and December. DeWildeman reports that "l'écorce est utilisée pour la préparation de lavements. Le bois sert à faire des pilons". Vernacular names include "djoanga", "ekulakwale", "linguenge", "momposo", "ngunge", "n'gungu", and "mungu".

Pieper cites Mildbraed 4600 from Cameroons and Laurent 1921, Pynert 657, 1046, and 1229, and Seret 885 from Belgian Congo. De Wildeman cites Bequaert 1245 and 2432, Bonnivair 5, Broun s.n., Claessens 374, 460, and 512, De Giorgi 1801, Goossens 4741, and Morteahan 1020 from Belgian Congo.

VITEX WILMSII Gürke, Notizbl. Bot. Gart. Berlin 3: 76. 1900.

Literature: Gürke, Notizbl. Bot. Gart. Berlin 3: 76. 1900; H. H. W. Pearson in T. iselt.-Dyer, Fl. Cap. 5: 212 & 216--217. 1901; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 53, 74, & 85, pl. 10 & 11. 1928; Worsdell, Ind. Lond. Suppl. 2: 501. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 89. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 122 & 203. 1949.

Illustrations: Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: pl. 10 & 11. 1928.

Large shrub or small tree, to 2.7 m. tall; branches terete, densely lanate-tomentose; leaves decussate-opposite, 3--5-foliate; petioles stout, 2--5 cm. long, densely lanate-tomentose;



leaflets sessile or short-petiolulate, the blades subcoriaceous, ovate or elliptic, 4.5--11 cm. long, 2--6 cm. wide, varying from short-acuminate or acute to obtuse at the apex, entire, sinuate and ciliate along the margins, cuneate or somewhat rounded at the base, puberulent or pubescent above, more or less lanate-tomentose along the midrib and secondaries beneath, otherwise puberulous or glabrous and profusely glandulose beneath; secondaries 7-10 per side, impressed above, prominent beneath; cymes axillary, divaricate, not surpassing the leaves, bracteate, the branches lanate-tomentose; peduncles 4--8 cm. long, lanate-tomentose; bractlets linear or linear-oblong, more or less falcate, acute at the apex, narrowed at the base, puberulent or pubescent, the lower ones 6--12 mm. long; pedicels short, bearing 2 prophylla; calyx campanulate, its tube prominently 10-veined, 3--3.5 mm. long, pubescent and profusely glandulose outside, glabrous within, the limb spreading, 5-lobed, the lobes broad, rounded and apiculate or subdeltoid and acute, about 1.5 mm. long and 2 mm. wide, pubescent and glandulose, the margins ciliate; corolla white, its tube about 6 mm. long, glabrous externally on the lower portion, pubescent and glandulose above, pubescent in the throat, the lobes reflexed, pubescent and profusely glandulose on the outer surface, glabrous within, the margins ciliate; stamens inserted at the middle of the corolla-tube, short-exserted; filaments dilated and villous toward the base; fruit drupaceous, obconic, about 6 mm. long and 3--4 mm. wide at the apex, shorter than the accrescent calyx, glabrous below, pubescent and glandulose above.

The species is based on F. Wilms 158 and 159 -- in whose honor it is named -- from near Lydenburg, Transvaal. It is said to be found in marginal bushveld, on rocky or wooded hillsides, and on the top of rather exposed mountain ridges, at altitudes of 2000 to 6000 feet, blooming in November, and fruiting in June. Pieper cites, in addition, Wilms 1249. It has been confused in the past with V. poara Corbishley.

Citations: SWAZILAND: Codd 4734 (Z). UNION OF SOUTH AFRICA: Cape of Good Hope: J. P. H. Acocks 13419 (Cb). Transvaal: Barnard & Mogg 761 (N); C. E. Gray 4187 (Af, N--photo, Z--photo); Meeuse 9325 (Ss); Thorncroft 13 [Herb. Wood 4156] (N, N--photo, Na--4685, Na--4686, Z--photo); Miss Williams s.n. [XI.1909] (Cb).

VITEX WILMSII var. REFLEXA (H. H. W. Pearson) Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 74. 1928.

Synonymy: Vitex reflexa H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 215--216. 1901.

Literature: H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 212 & 215--216. 1901; E. E. Galpin, Bot. Surv. S. Afr. Mem. 7: 23 & 25, fig. 50. 1925; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 74 & 85. 1928; O. B. Mill., Tydskrif van Suid-Afric. Bosbouwer. 6: 93 & 95. 1941; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104. 1942; Moldenke, Alph. List Invalid Names 55. 1942; Moldenke, Phytologia 2: 123. 1944; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 121, 122, &

203. 1949.

Illustrations: E. E. Galpin, Bot. Surv. S. Afr. Mem. 7: fig.

50. 1925.

This variety differs from the typical form of the species only in the less dense pubescence on its leaflets.

It is a shrub 2.5 m. tall or a tree 3--10 m. tall, the trunk 22.5--30 cm. in diameter; wood grayish-yellow, very hard or of medium hardness and weight, the grain straight and, though somewhat short, of fair strength, working easily, taking a good finish, not attacked by termites after being properly seasoned; branches subterete, hollow, finely tawny-tomentose, with light and striate lenticellate bark when mature and very prominent leaf-scars; leaves opposite or subopposite, 5-foliolate; petioles 4--5 cm. long, finely tomentose; petiolules 2--10 mm. long, canaliculate, tomentose; leaflet-blades membranous, oblong-elliptic or obovate, 5.5--8.5 cm. long, 2.5--4 cm. wide, subacute or obtuse at the apex, entire, with slightly thickened pubescent margins, cuneate at the base, profusely glandulose, glabrescent and dark-brown in drying above, pubescent (especially along the midrib and secondaries) and lighter in color beneath; secondaries 8--12 per side, impressed above, prominent beneath; cymes axillary, pedunculate, divaricate, about as long as the subtending leaves, bracteolate, finely tomentose; peduncles flattened, 5--6 cm. long; bractlets linear-oblong or elliptic, about 10 mm. long, acute at the apex, attenuate at the base, puberulent; flowers short-pedicellate, bracteolate, 8--10 mm. long; calyx campanulate, its limb spreading, subequally 5-lobed, its tube about 4 mm. long, 10-veined, glabrous within, profusely glandulose and minutely pubescent outside, the lobes short, broadly ovate, about 2 mm. long, 2.5--3 mm. wide, acute at the apex, with prominent reticulate venation, profusely glandulose, pubescent; corolla mauve or pale-mauve, its tube glabrous below, minutely pubescent and profusely glandulose above the middle on the outside, with a ring of hairs about the middle and pubescent above in the anterior portion within the tube, the lobes strongly reflexed, finely pubescent and profusely glandulose; stamens inserted at about the middle of the corolla-tube, short-exserted; filaments broader and villous toward the base; ovary subglobose, pubescent and glandulose above the middle; fruit drupaceous, obconic, shorter than the accrescent fruiting-calyx, about 4 mm. long and 3 mm. wide near the apex, light-colored, glandulose, pubescent on the upper part.

The type of this variety was collected by Ernest Edward Galpin (no. 602) in dongas around Barberton, Transvaal, Union of South Africa, at an altitude of 2800 feet. It is said to inhabit savanna-woodland and sandy loam, at altitudes of 2300 to 3100 feet, blooming in November and December. Common names are "ama-kosikati", "manohani", "mokoele", "pyp steel", and "pypsteel". It has been confused in the past with V. mooiensis var. rudolphi H. H. W. Pearson. Galpin says of his no. 282m: "closely related to V. reflexa.....and probably a new species.....abundant and increasing in the sand veld, to which it is strictly confined.....owing to

the many stronger timbers available, it is little used locally, but should be useful for general purposes. Used by natives for stools. The young twigs have hollow stems and are used as stems for tobacco pipes, hence the local name 'pypsteel'....wood used for hammers, handles, etc."

Citations: SWAZILAND: Codd 4734 (Rh); H. E. Hornby 2802 (N); O. B. Miller S.254 (Z). UNION OF SOUTH AFRICA: Transvaal: E. E. Galpin 282m (Gg--208426, N), 602 (N--isotype, N--photo of type, Na--8741--type, S--photo of type, Z--photo of type); F. A. Rogers 24065 (S), 25027 (S).

VITEX WIMBERLEYI Kurz, For. Fl. Brit. Burma 2: 271. 1877.

Literature: Kurz, For. Fl. Brit. Burma 2: 271. 1877; Jacks., Ind. Kew. 2: 1214. 1895; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 56 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 89. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 129 & 203. 1949.

Small evergreen tree much resembling V. sumatrana Miq.; young shoots puberulent; leaves 3--5-foliolate; petioles slender, 5--7.5 cm. long, glabrous; leaflets petiolulate or the basal ones sessile; leaflet-blades chartaceous, elliptic-oblong to lanceolate, acuminate at the apex, coarsely crenate-serrate, asymmetric and acute at the base, glabrous, glossy; petiolules slender, glabrous; flowers small, sessile or subsessile, clustered or cymulose, forming puberulent loosely bracteolate panicles at the ends of the branches and in the axils of the upper leaves; bracts caducous, the lowest ones diminutively foliaceous, the upper ones linear-oblong and grading into the linear-lanceolate acute bractlets which are about as long as the calyx; calyx about 4 mm. long, velvety, the rim truncate and broadly toothed; corolla pubescent on the outside, its tube short and wide, the lobes blunt, the lowermost much produced.

The species inhabits the tropical forests of the Andaman Islands, flowering in the rainy season. No specific type specimens are cited by the author.

VITEX YAUNDENSIS Gürke in Engl., Bot. Jahrb. 33: 296--297. 1904.

Synonymy: Vitex yaundense Gürke ex Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104, sphalm. 1942.

Literature: Gürke in Engl., Bot. Jahrb. 33: 296--297. 1904; Prain, Ind. Kew. Suppl. 3: 189. 1908; Mildbr. in Von Mecklenb., Ergebn. Deutsch. Zentral-Afrik. Exped. 2: 90. 1910--1911; Wheeler, Bull. Am. Mus. Nat. Hist. 45: 446--447. 1922; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 46, 59, & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104 (1942) and [ed. 2], 144 & 203. 1949.

Tree, 6--8 m. tall; branches tetragonal, glabrous; leaves 5-foliolate; petioles 15--22 cm. long, canaliculate above, glabrous; petiolules 1--2 cm. long; leaflet-blades herbaceous, oblong-ovate, long-acuminate at the apex, entire, narrowed at the base into the petiolule, glabrous on both surfaces, the central one to 24 cm.

long and 9 cm. wide, the lateral ones to 20 cm. long, and the basal ones to 14 cm. long and 7 cm. wide; secondaries very numerous, to 25 in number, parallel; inflorescence in the axils of the upper leaves, composed of loose dichasia with very long branches; peduncles 16--20 cm. long; bractlets sessile, linear, long-acuminate at the apex, finely pubescent, the lower ones to 15 mm. long, the upper ones much shorter; pedicels 2--3 mm. long, finely pubescent; calyx turbinate, about 3 mm. long, pubescent, its rim 5-toothed, the teeth deltoid, 1 mm. long and about as wide at the base, rather acute at the apex; corolla greenish-yellow, its tube very stout, only 4 mm. long, the limb plainly 2-lipped and 5-lobed, the 2 posterior lobes ovate, about 1 mm. long, obtuse at the apex, and pubescent, the 2 side lobes of the same shape and pubescence as the posterior ones but 2 mm. long, the anterior lobe violet, spatulate, about 4 mm. long, somewhat emarginate at the apex, pilose at the base and on a mid-line, otherwise glabrous.

The type of this species was collected by Georg August Zenker (no. 1412) in the virgin forest at Yaunda Station, at an altitude of 800 meters, Cameroons, in June, 1897. Pieper also cites Mildbraed 5607 from the forests of southern Cameroons. Wheeler reports that the stems of this species are infested by ants, probably Viticicola tessmanni (Stitz). The species belongs in subgenus Euvitex, section Axillares, subsection Cymosae, grex Glandulosae, group Eutriches, subgroup Griseae, and secondary subgroup Parallelae. It is related to V. grandifolia Gurke, but differs in its sparse and lax inflorescences and very numerous secondary veins. The nodes of the branches and branchlets usually have the characteristic round holes indicating myrmecophily.

Citations: CAMEROONS: Zenker 1412 (N--isotype, N--photo of isotype, S--isotype, Z--photo of isotype). BELGIAN CONGO: Delevoy 706 (Br).

VITEX YUNNANENSIS W. W. Sm., Not. Bot. Gard. Edinb. 9: 141--142. 1916.

Literature: W. W. Sm., Not. Bot. Gard. Edinb. 9: 141--142. 1916; Hand.-Mazz., Symb. Sin. 7: 906. 1936; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 57 & 104. 1942; P'ei, Bot. Bull. Acad. Sin. 1: 5. 1947; Hill & Salisb., Ind. Kew. Suppl. 10: 244. 1947; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 133 & 203. 1949.

Shrub 1--5 m. tall; branchlets at first tomentellous with yellow-glanduliferous hairs, later glabrescent and cinereous; leaves 3- [rarely 5-] foliolate; petioles 1.5--3 cm. long, fulvous-tomentellous; leaflets unequal, the terminal one larger and on a petiolule about 2 mm. long, the lateral ones very short-petiolulate, the basal ones smallest; leaflet-blades papyraceous, ovate, rather obtuse at the apex, entire or sometimes coarsely few-sinate or even lobed, broadly cuneate or rounded at the base, ciliolate along the margins, dark-green above and sparsely pilosulous on the veins or often short-strigillose and with scattered shiny-yellow glands above, fulvous beneath,



densely white-pilose along the midrib and secondaries or sometimes very shortly crisped-pilose on the midrib beneath, the remainder almost glabrous, glandulose, the central ones 3--6.5 cm. long and about 2 cm. wide; inflorescence axillary, the cymules 3--7-flowered; peduncles to 1 cm. long, white-pilose and densely glandulose; pedicels 2--3 mm. long, white-pilose and densely glandulose; bractlets linear, scarcely 1 mm. long, white-pilose and densely glandulose; calyx campanulate, about 3 mm. long, white-pilose, glandulose, its rim 5-toothed, the teeth broadly triangular, scarcely 0.5 mm. long, obtuse at the apex; corolla white, often tinged with rose or blue, to 17 mm. long, its tube almost 10 mm. long, slightly incurved, slightly dilated above, puberulent on the outside, densely white-pilose at the insertion of the stamens inside, the lobes unequal, rounded at the apex, glandulose externally, glabrous within, the anterior lobe about 7 mm. long; filaments white-pilose at the base, glabrous above; ovary 2--4-celled; fruiting-calyx almost 1 cm. wide; fruit drupaceous, globose, about 10 mm. wide, with a bony endocarp.

The species is based on G. Forrest 10100 from open scrub on the descent to the Yangtze River from the eastern boundary of the Lichiang Valley, Yunnan, China, at about latitude 27°15' N., at an altitude of 9000 to 10,000 feet, in June, 1913, and on G. Forrest 12471 from open dry situations in the Feng Kow Valley, Yunnan, at about latitude 27°40' N., at an altitude of 8000 feet, in June, 1914. Smith also cites Forrest 10719, 10819, and 11349 as probably belonging to this species, although the first of these has larger and less hairy leaves. The species is related to V. vestita Wall. It has been collected in flower from May to August, and in fruit in July and September. It inhabits grassy flats in alpine areas, at altitudes of 1500 to 3500 meters. P'ei records it from Sikiang.

Citations: CHINA: Szechuan: Handel-Mazzetti 2460 (N); Rock 16128 (N), 17805 (N), 23725 (N), 24298 (N); H. Smith 10266 (Go). Yunnan: Forrest 11349 (N--photo).

VITEX ZANZIBARENSIS Vatke, Linnaea 43: 533. 1882.

Literature: Vatke, Linnaea 43: 533. 1882; Gürke in Engl., Pflanzenw. Ost-Afr. C: 339. 1895; J. G. Baker in Thiselt.-Dyer, Fl. Trop. Afr. 5: 318. 1900; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 41, 53, & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 50 & 104 (1942) and [ed. 2], 117 & 203. 1949.

Shrub, 4--5 m. tall; branchlets short-pubescent; leaves 3--5 foliolate; petioles 4--5 cm. long; leaflets sessile, the blades moderately firm, oblong-lanceolate, 7.5--10 cm. long, about 2.5 cm. wide at the middle, acuminate at the apex, entire, narrowed to the base, green and glabrous on both surfaces; cymes laxly disposed on the branches of an ample panicle, the branchlets covered with a short whitish pubescence; bractlets lanceolate, minute; calyx campanulate, about 2 mm. long and wide at time of anthesis, canescent, its rim 5-toothed, the teeth minute; cor-

olla lilac, about 6 mm. long, its tube infundibular, the lobes very small.

The type of this species was collected by Johann Maria Hildebrandt (no. 1303) at Bagamoyo, Tanganyika Territory. Pieper cites in addition Holtz 1096 and Martin 3133 from Tanganyika.

VITEX ZENKERI Gurke in Engl., Bot. Jahrb. 33: 293. 1904.

Literature: Gurke in Engl., Bot. Jahrb. 33: 293. 1904; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 43, 57, & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 48 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 90. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 114 & 203. 1949.

The species is based on two collections of Georg August Zenker -- in whose honor it is named -- his nos. 839 and 1545 from the Cameroons. Pieper cites in addition Lotz 136 and Zenker 1006 from the same area.

Citations: CAMEROONS: Zenker 139 (Gg--151106), 839 (S--cotype), 1545 (N--photo of cotype, S--cotype, Z--photo of cotype), 4843 (Br, Br, N, S), 5315 (Gg--245945, N), s.n. [May 1896] (N). BELGIAN CONGO: Delevoy 653 (Br).

VITEX ZEYHERI Sond. ex Schau. in A. DC., Prodr. 11: 693. 1847.

Literature: Schau. in A. DC., Prodr. 11: 693. 1847; Kuntze, Rev. Gen. Pl. 3 (3): 258. 1898; H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 212 & 216. 1901; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 53, 74, & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104. 1942; H. N. & A. L. Moldenke, Pl. Life 2: 90. 1948; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 2], 121, 122, & 203. 1949.

Tree, about 3.2 m. tall; bark rough, black; branches terete, densely covered with a light tawny tomentum; leaves opposite or subopposite, 3--5-foliolate; petioles 2--4 cm. long, tomentose; leaflets sessile or subsessile; leaflet-blades coriaceous, oblong or oblong-lanceolate, 4.5--7.5 cm. long, 1.4--3.2 cm. wide, acuminate or shortly acute to rounded at the apex, entire, cuneate at the base, canescent, densely glandulose; secondaries 8--13 per side, obscure; cymes axillary, divaricate, equaling or slightly surpassing the subtending leaves, bracteate, densely and finely tomentose; peduncles flattened, 3--5 cm. long, tomentose; bracts linear-subulate or narrow-spatulate, canescent, the lower ones 6--12 mm. long; calyx campanulate, its tube about 4 mm. long, 10-veined, finely tomentose and glandulose externally, glabrous within, the limb 5-lobed, the lobes broadly ovate, 1--1.5 mm. long, acute at the apex, spreading, tomentose, glandulose; corolla-tube straight, about twice as long as the calyx, pubescent and densely glandulose externally, villous within above the insertion of the stamens, the lobes pubescent; stamens inserted at or below the middle of the corolla-tube, short-exserted; filaments villous toward the base; ovary globose, pubescent, glandulose; fruit drupaceous, obconic, about 3 mm. long, 2--3 mm. wide, shorter than the accrescent spreading fruiting-calyx, minutely pubescent and

glandulose.

The type of this species was collected by Carl Ludwig Philipp Zeyher (no. 73) -- in whose honor it is named -- on the banks of the Crocodile River, Transvaal, Union of South Africa. This is, however, probably the same collection which is labeled "Burke 73" in the Kew and British Museum herbaria and which agrees very closely with Schauer's description. Burke and Zeyher visited the Magalies Berg together and may sometimes have used the same numbers. The species has been found on quartz conglomerate, on river banks, and is said to be dominant on steeper slopes. It has been collected at an altitude of 3200 feet, in flower in November, and in fruit in April. Specimens have been misidentified in herbaria as "V. rehmannia Gürke" and as Clerodendron sp., as well as the following variety. Pearson cites, in addition, two Holub s.n. collections from Bechuanaland Protectorate.

Citations: UNION OF SOUTH AFRICA: Cape of Good Hope: Wahlberg s.n. (S, S). Transvaal: J. Burk s.n. [Magalies-Berg] (N); Codd 1167 (Ss); R. Leendertz 932 (Na--15691); Mogg & Phillips s.n. [6.4.35] (Ss); Nickerk & Wassfall 19 (N, Rh); A. A. Obermeyer s.n. [Herb. Transvaal Mus. 35150] (N, N--photo, Na--27617, S--photo, Z--photo); Pole-Evans H.18060 (Z); F. A. Rogers 20377 (S); Scott Elliot 1492 (C); J. Thode A.1484 (Na--24887), s.n. [Zeerust, Dec. 1927] (Na--18309); Wahlberg s.n. [Jan. 1842] (S).

VITEX ZEYHERI var. BREVIPES H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 216. 1901.

Literature: H. H. W. Pearson in Thiselt.-Dyer, Fl. Cap. 5: 216. 1901; Pieper in Engl., Bot. Jahrb. 62, Beibl. 141 ["142"]: 74 & 85. 1928; Moldenke, Known Geogr. Distrib. Verbenac., [ed. 1], 52 & 104 (1942) and [ed. 2], 122 & 203. 1949.

This variety differs from the typical form of the species in having the petiolules 2--6 mm. long and canescent and the leaflet-blades 4--5 cm. long and 8--16 mm. wide.

The variety is based on two collections, one by Carl Philipp Zeyher (no. 1369) from the northern slopes of the Magalies Berg, near the Crocodile River, Transvaal, Union of South Africa, and the other by J. Burke (s.n.) from near the Aapies River, Transvaal. The Kew specimens, which alone were examined by Pearson, are in an immature state of development. Therefore Pearson notes that "more advanced material may justify its separation as a species."

Citations: UNION OF SOUTH AFRICA: Transvaal: J. Burke s.n. [Aapies River] (N--cotype); Zeyher 1369 (S--cotype).

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